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# NAVAL POSTGRADUATE SCHOOL
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**Oceanographic Data from Sur Ridge (36.3°N, 122.4°W) to Hoke Seamount (32.1°N, 126.9°W), May 1999**

by

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**13. ABSTRACT** *(maximum 200 words)*

This data report contains oceanographic data collected along the geodesic between Sur Ridge (36.3°N, 122.4°W) and Hoke Seamount (32.1°N, 126.9°W). Tables of water properties (temperature, salinity, dissolved oxygen, and nutrients) are included, as well as figures which show results of bathymetric and ocean current measurements. Finally, a sample of video images of fauna observed on the summit of Hoke Seamount is included.

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# NAVAL POSTGRADUATE SCHOOL
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Ocean Acoustic Federation: California Current Tomography
1999 Hoke Seamount Data Report

## 1. Introduction

In May 1999, an HLF-5 acoustic transmitter was moored on the top of Hoke Seamount (32.1°N, 126.9°W) to test the feasibility of tomographic imaging of the California Current system. In addition to mooring activities, CTD (conductivity-temperature-depth), ADCP (acoustic Doppler current profiler) and bathymetric data were collected along the geodesic between Hoke Seamount and Sur Ridge (36.3°N, 122.4°W) (figure 1). This report does not address any aspects of the mooring at Hoke Seamount, but instead is intended to document the procedures used to collect all the other data from this cruise and to provide listings of subsets of these data.

## 2. CTD

Hydrographic data were acquired at 33 sites along the line from the Hoke Seamount to Sur Ridge (figure 1) using a Seabird 911-Plus™ CTD. The CTD sampled at 24 Hz, and was fitted with dual Seabird temperature (SBE-3) and conductivity (SBE-4) sensors, a Chelsea fluorometer, a SeaTech Transmissometer, and a Seabird oxygen probe. The CTD is maintained for use aboard the *R/V Point Sur* by the Marine Operations division of Moss Landing Marine Laboratories (MLML). The MLML CTD is mounted horizontally at the bottom of its frame, with both primary and secondary temperature and conductivity sensors mounted alongside. Each temperature/conductivity pair has a common access tube to the seawater, with all the sensors mounted such that both seawater access tubes are equally well clear of all obstructions to the water flow while the CTD is in operation. For this cruise, the various sensors had been calibrated by their respective manufacturers as follows:

| | |
|---|---|
| Primary Temperature (s/n 2632): | 11 February 1999 |
| Secondary Temperature (s/n 2673): | 11 February 1999 |
| Primary Conductivity (s/n 2196): | 9 March 1999 |
| Secondary Conductivity (s/n 2197): | 9 March 1999 |
| Pressure (s/n 75425): | 19 January 1999 |
| Chelsea Fluorometer (s/n 88210): | 10 February 1999 |
| SeaTech Transmissometer (s/n 243DR): | 26 February 1999 |
| Oxygen (s/n 354): | 14 August 1997 |

Pre- and post-cruise temperature calibrations differed by a maximum of 0.000025°C.

A Seabird rosette sampler was attached above the CTD and was equipped with twelve 10-liter Niskin bottles for *in situ* water sampling. Water samples were collected at standard depths (Appendix B) for chemical (nutrient) analyses and for CTD salinity calibration. No *in situ* water samples were collected for oxygen sensor calibrations.

In general, at each station the CTD was lowered to about 100 meters at a speed of approximately 0.5 $m\text{-}s^{-1}$, and thereafter to 1000 meters (or the bottom, whichever came first) at a speed of 1.0 $m\text{-}s^{-1}$. Approximately every fourth station the CTD was lowered beyond 1000 meters

to the bottom (Appendix A). A minimum of two water samples-- one at the deepest depth of the cast and one near the surface-- was collected during the upcast at each station for salinity calibration. For those stations which went deeper than 1000 meters, additional water samples were also collected below 1000 meters for salinity calibration. These water samples were then analyzed in the laboratory immediately following the cruise using a Guildline Autosal 8400B salinometer, which itself had been standardized using Batch P132 standard Wormley water.

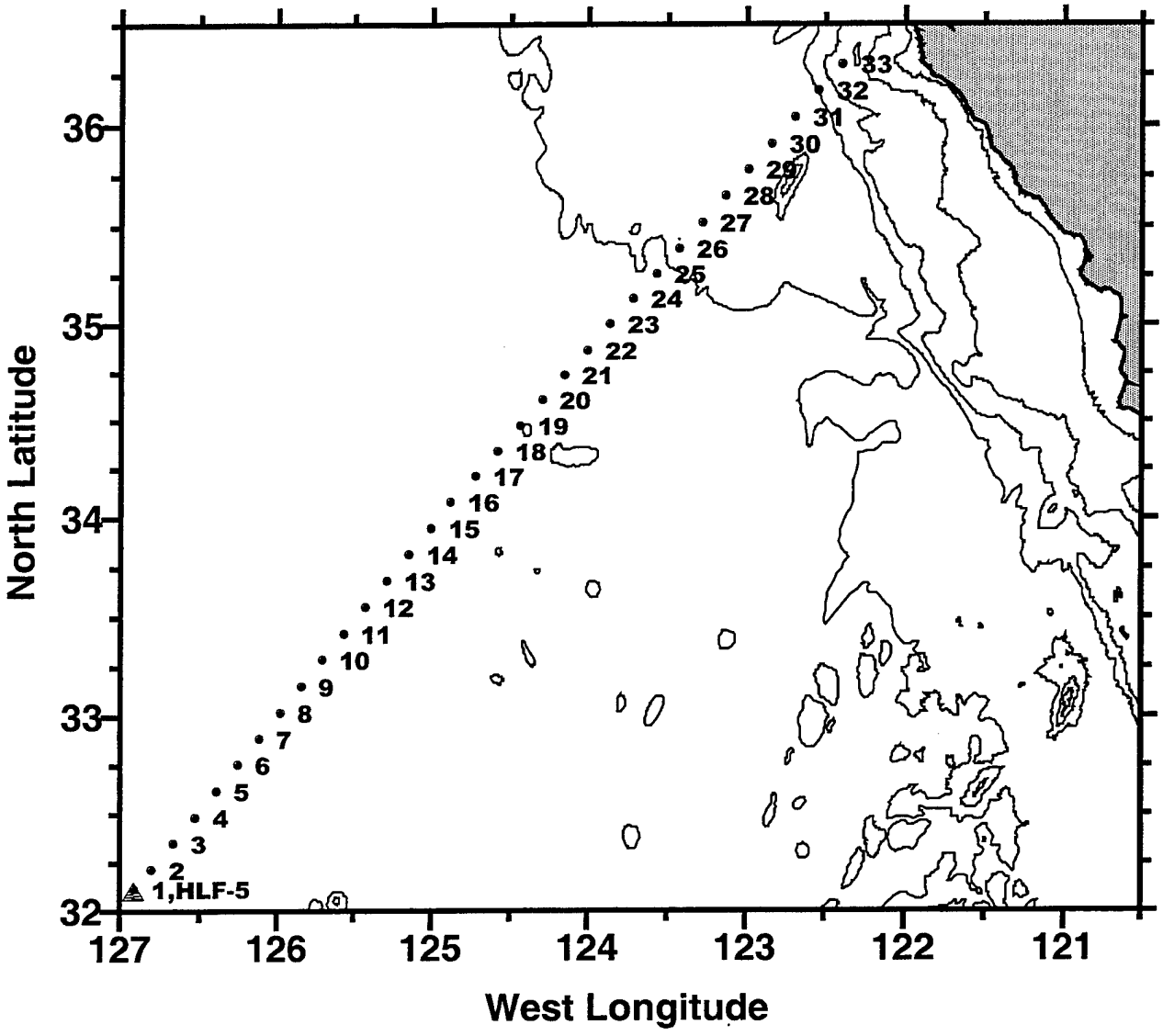


**Figure 1.** CTD Station Sites. The 200, 1000, 2000, 3000, and 4000 meter isobaths are shown.

### a. Salinity Calibration

With dual temperature and conductivity sensors there are four possible calculations of CTD salinity. The salinities determined by the Autosal for the collected water samples were directly compared with each of the calculated CTD salinities recorded when those water samples were captured by the Niskin bottles. Ninety-five deep water samples, where deep is defined as greater than 800 meters, were thusly compared. For each sensor combination the mean and standard deviation of the salinity difference (Autosal measured salinity-CTD salinity value) were determined. All data values greater than two standard deviations beyond the mean were then removed, and new means and standard deviations were determined. The results of these manipulations showed that using both secondary CTD sensors (temperature and conductivity) produced the best calculated CTD salinity for this cruise. Thus, based on a final total of 90 water samples, the CTD salinity (S11) in this data report has been corrected by an offset of +0.0014. (The standard deviation of this offset was $\pm$0.0011.)

### b. Nutrient Measurements

Samples of nutrients were drawn into 25 ml polyethylene containers. These were rinsed twice before filling. Samples were immediately frozen at –20°C. Nutrient analyses were performed by segmented flow analysis with an Alpkem rapid flow analyzer (RFA) system. Nitrate, nitrite, phosphate and silicate were determined simultaneously. Determinations were carried out according to the methods described by Sakamoto *et al.* (1990). Nitrate+nitrite was determined after reduction of nitrate to nitrite by a copper-coated cadmium metal column and the total nitrate+nitrite is measured as an azodye at an absorbance of 540 nm. Nitrite is also determined as an azodye. The determination of phosphate is based on the reaction of the ions with an acidified molybdate reagent. Under acid conditions a phosphomolybdate complex is formed which is subsequently reduced to a phosphomolybdenum blue complex detectable at 820 nm. The determination of silicate is based on the formation of a yellow silicomolybdic acid, which is then reduced with stannous chloride to a coloured blue complex and measured at an absorbance of 880 nm. Analytical errors for nitrate, nitrite, phosphate, and silicate are $\pm$0.06 $\mu$mol-l$^{-1}$, $\pm$0.005 $\mu$mol-l$^{-1}$, $\pm$0.003 $\mu$mol-l$^{-1}$, and $\pm$0.19 $\mu$mol-l$^{-1}$, respectively.

### c. Data Presentation

CTD data are presented both as tables in the appendices of this report and as a series of graphs (figure 2). Appendix A lists the CTD data for selected depths for all the CTD stations. Density anomaly, specific volume, dynamic height, and spiciness are computed from the processed, corrected values of pressure, temperature, and salinity. The density anomaly ($\gamma_\theta$) was calculated using potential temperature referenced to the ocean surface. Except for spiciness, derived quantities were calculated using algorithms given in Volume 4 of the International Oceanographic Tables (UNESCO, 1987). Spiciness ($\pi$) was computed with algorithms of Pierre Flament (1986) using potential temperature. The tables in Appendix A are presented with the following parameters, units and symbols:

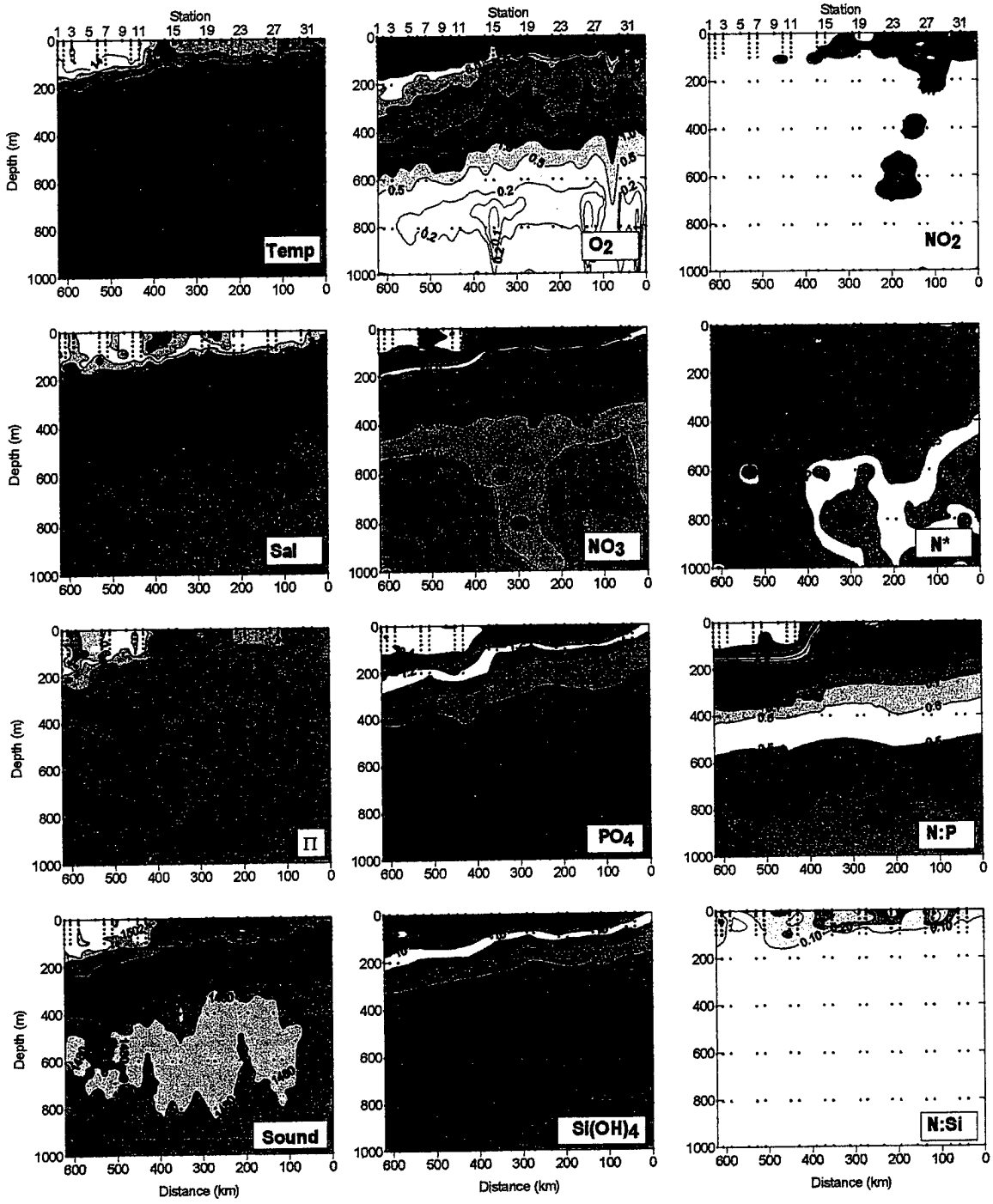


**Figure 2.** Sections of water properties from Sur Ridge to Hoke Seamount. Axes are distance (km) from Sur Ridge versus depth (m). (CTD station sites are shown at the top of the figure.) The property being mapped is shown on each diagram. Units are the same as given in Appendices A and B. Sound speed is in m/s; ratios (N:Si, N:P) are dimensionless. N* (units = μmol/kg) is defined by Gruber and Sarmiento (1997).

| | |
|---|---|
| Pres [dbar] | pressure |
| Temp [°C] | potential temperature (1990) |
| Sal | salinity (from secondary sensors) |
| $\gamma_\theta$ [kg-m$^{-3}$] | density anomaly |
| $\delta$ [$10^{-8}$ m$^3$-kg$^{-1}$] | specific volume anomaly |
| $\Sigma\Delta D$ [$10^{-1}$ m$^2$-s$^{-2}$] | dynamic height |
| $\pi$ | spiciness |
| Trans. [percentage] | transmissivity |
| Oxygen [mg-l$^{-1}$] | oxygen concentration |

Appendix B lists the nutrient data at the standard depths at which Niskin bottles were tripped during the CTD casts. The tables in Appendix B are presented with the following parameters, units, and symbols:

| | |
|---|---|
| Pressure [dbar] | pressure |
| Temperature [°C] | temperature |
| Salinity | salinity (from secondary sensors) |
| $PO_4$ [µmol-l$^{-1}$] | phosphate |
| $Si(OH)_4$ [µmol-l$^{-1}$] | silicate |
| $NO_3$ [µmol-l$^{-1}$] | nitrate |
| $NO_2$ [µmol-l$^{-1}$] | nitrite |

Finally, in addition to the standard water properties, figure 2 presents vertical distributions of the nutrient ratios (nitrate:phosphate [N:P], nitrate:silicate [N:Si]) and of $N^*$. $N^*$ is a quasi-conservative parameter that estimates the nitrate deficit/excess of the water masses (Gruber and Sarmiento, 1997). In this derived parameter all the nitrate variability due to remineralization of organic matter is removed. Consequently, the remaining variability is due to denitrification less nitrogen fixation processes in the water column. $N^*$ is defined as a linear combination of nitrate ($NO_3$) and phosphate ($PO_4$) in the form

$$N^* = (NO_3) - (\text{rnitrN:P})(PO_4) + \text{constant},$$

where *rnitrN:P* is the N:P stoichiometric ratio during aerobic oxidation of organic material. Using values of 16, -104, and 125 as N:P ratios for nitrification, denitrification, and nitrogen fixation, respectively, Gruber and Sarmiento (1997) arrive at the following relationship:

$$N^* = (NO_3 - 16 \times PO_4 + 2.90) \times 0.87 \text{ µmol-kg}^{-1}.$$

High concentrations of $N^*$ (>2.0 µmol-kg$^{-1}$) suggest the prevalence of nitrogen fixation processes. On the other hand, low levels of $N^*$ (<-3 µmol-kg$^{-1}$) point to a prevalence of denitrification.

## 3. VM-ADCP

Continuous ADCP data were collected throughout the cruise using the ship-mounted RD Instruments 150 kHz narrow band ADCP. Five-minute ensemble averaging was used. Navigational input was supplied to the data stream by a differential GPS unit. An Ashtech GPS receiver also supplied attitude information to the data stream. The ADCP data were processed using the CODAS software of the University of Hawaii (Firing *et al.*, 1995). The data were then binned by 0.1°-latitude intervals and rotated 42° counterclockwise to facilitate comparison with the

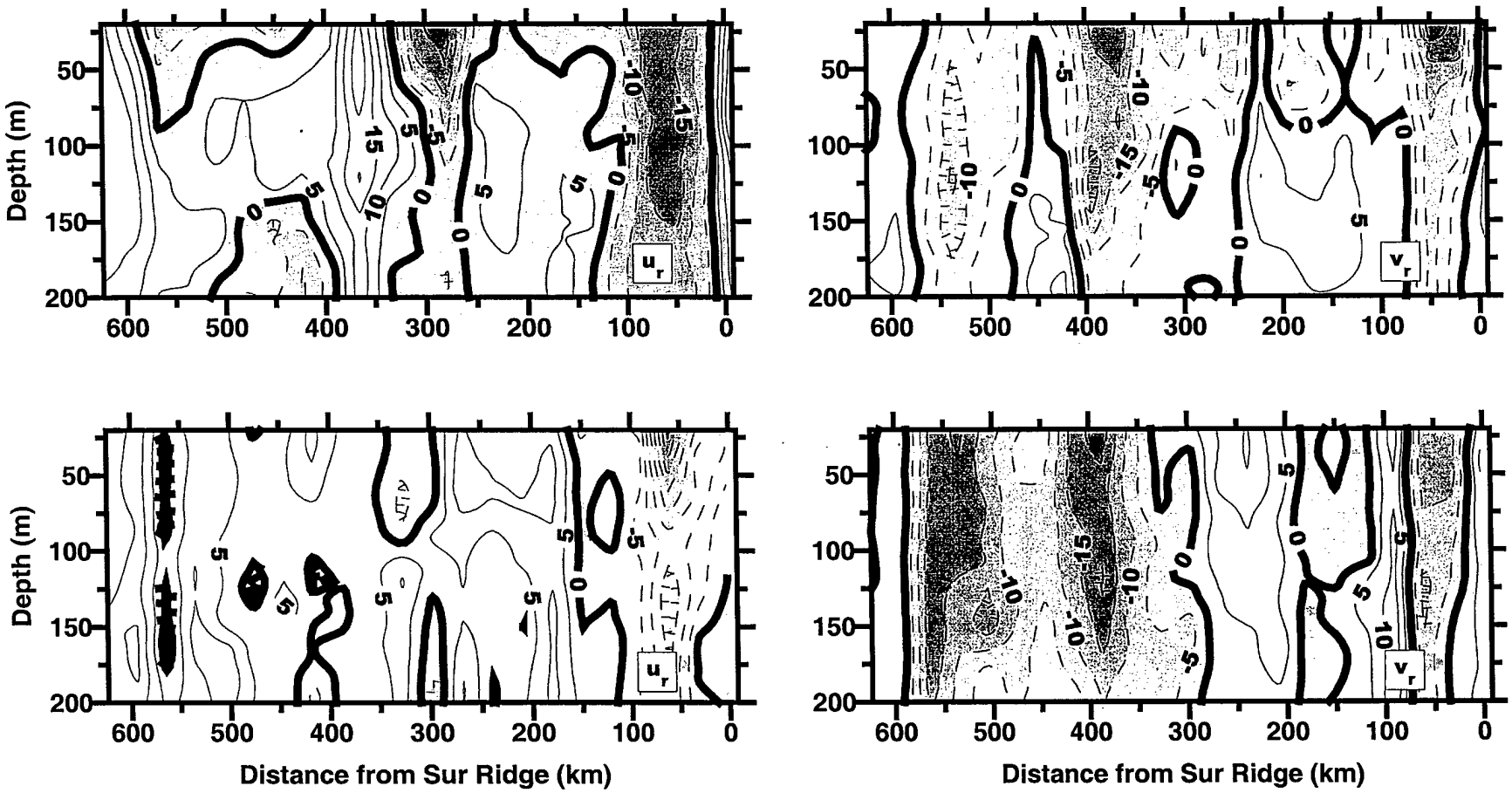


**Figure 3.** Along section velocities ($u_r$, left) and across section velocities ($v_r$, right), cm/s, measured by ADCP. Results are presented for the leg from Sur Ridge to Hoke Seamount (top) and return (bottom).

hydrographic data. Results from the ADCP are shown in figure 3, where the data are separated by outbound leg (to mooring deployment on Hoke Seamount) and inbound leg (returning from mooring deployment).

## 4. Bathymetry

### a. Sur Ridge to Hoke Seamount

Bathymetric data were collected along the hydrographic line from Sur Ridge to the Hoke Seamount as the ship steamed to the HLF-5 mooring deployment. Data were collected using a Knudsen echo sounder with a 12 kHz ship-mounted transducer. Uncorrected depth values were recorded by hand. These uncorrected depth values were then used to produce figure 4, which illustrates the bottom depth along the geodesic line between the Hoke Seamount and Sur Ridge.

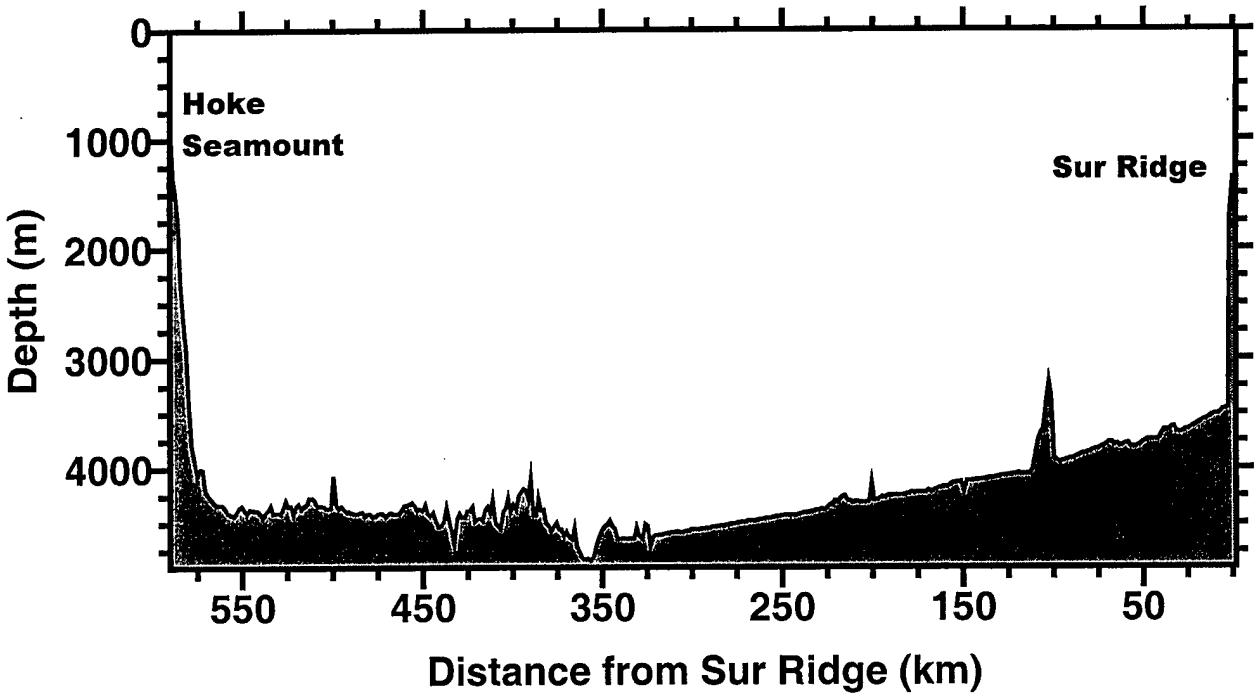


**Figure 4.** Bottom topography from Hoke Seamount to Sur Ridge.

### b. Hoke Seamount

An extensive bathymetric survey of the Hoke Seamount was conducted prior to deploying the HLF-5 source there. As above, the data were collected using a Knudsen echo sounder with a

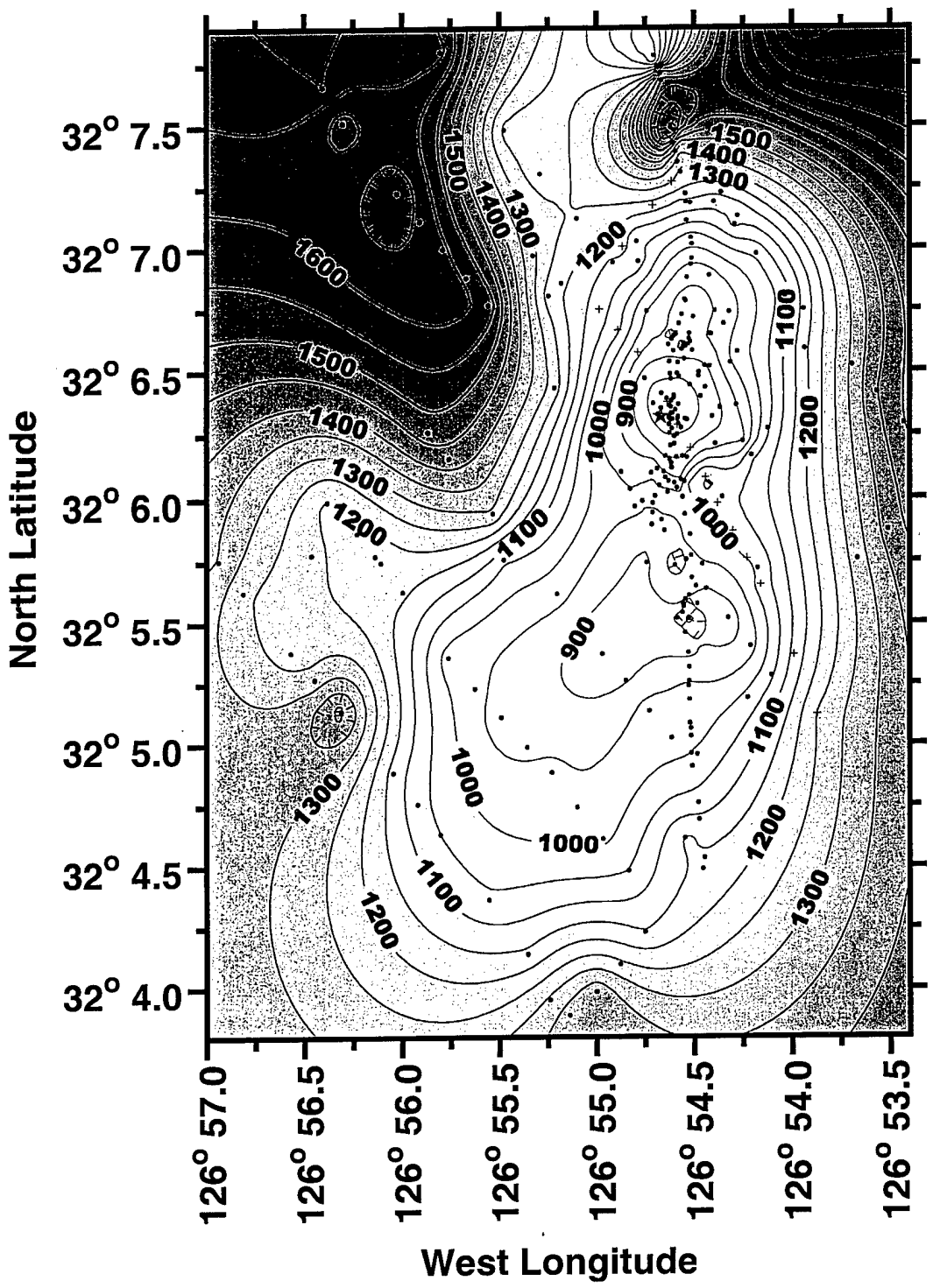


**Figure 5.** Bathymetry for the area near the Hoke Seamount summit. Isobaths on the chart are (uncorrected) meters. Locations of depth measurements from the 1999 survey are indicated by dots, while those from the 2000 survey are indicated by crosses. The location of the HLF-5 mooring is denoted by a star.

12 kHz ship-mounted transducer. These uncorrected depth values, augmented by another 17 depth values collected in the same manner a year later (May 2000) when the HLF-5 mooring was recovered, were used to produce a chart (figure 5) of the Hoke Seamount. The shallowest depth observed was 772 uncorrected meters.

## 5. Video Images of Hoke Seamount Summit

For this cruise, the Monterey Bay Aquarium Research Institute (MBARI) provided a Benthic Camera System to videotape the summit area of the Hoke Seamount prior to deployment of the HLF-5 mooring. Essentially, this system is a VCR housed in a waterproof sled designed to be flown/towed just above the seafloor. Weights-- in this case, large single chain links-- are suspended from each end of the sled, both to stabilize its flight and to prevent it from getting too close to the seafloor. Still frames (figure 6) from the VCR record are shown below.

## 6. Acknowledgements

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**Figure 6.** Still images of the summit of Hoke Seamount. The large chain links are attached to the MBARI Benthic Camera sled. The bugle-like objects in two of the frames are believed to be "goiter sponges."

## Appendix A. CTD Tables

CTD data for selected depths are listed chronologically by CTD station. Dissolved oxygen values listed herein were not calibrated with *in situ* water samples. Based on results from other cruises in this area, it is likely that the oxygen values listed here are too low. (See section 2c for further details on the properties listed in these tables.)

**STATION:** 1 **DATE:** May 3, 1999 0243 UT
**LATITUDE:** 32° 06.94 N. **LONGITUDE:** 126° 54.49 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 14.8373 | 33.2968 | 24.694 | 323.94 | 0.006 | 0.7440 | 91.670 | 8.4381 |
| 5.0 | 14.8379 | 33.2968 | 24.694 | 324.03 | 0.016 | 0.7440 | 91.675 | 8.4166 |
| 10.0 | 14.8371 | 33.2965 | 24.694 | 324.17 | 0.032 | 0.7435 | 91.690 | 8.3773 |
| 15.0 | 14.7967 | 33.2968 | 24.703 | 323.45 | 0.049 | 0.7346 | 91.665 | 8.3611 |
| 20.0 | 14.7480 | 33.2956 | 24.713 | 322.68 | 0.065 | 0.7227 | 91.640 | 8.3515 |
| 25.0 | 14.7360 | 33.2948 | 24.715 | 322.63 | 0.081 | 0.7192 | 91.625 | 8.3355 |
| 30.0 | 14.7356 | 33.2952 | 24.716 | 322.72 | 0.097 | 0.7194 | 91.620 | 8.3130 |
| 40.0 | 14.7300 | 33.2948 | 24.717 | 322.90 | 0.129 | 0.7175 | 91.620 | 8.2928 |
| 50.0 | 14.4916 | 33.2807 | 24.757 | 319.35 | 0.161 | 0.6538 | 91.560 | 8.3095 |
| 60.0 | 14.0977 | 33.2283 | 24.800 | 315.55 | 0.193 | 0.5269 | 91.470 | 8.3549 |
| 70.0 | 13.9444 | 33.2006 | 24.810 | 314.80 | 0.225 | 0.4719 | 91.430 | 8.3673 |
| 80.0 | 13.8600 | 33.1890 | 24.819 | 314.24 | 0.256 | 0.4445 | 91.510 | 8.3478 |
| 100.0 | 13.8105 | 33.1856 | 24.827 | 314.01 | 0.319 | 0.4308 | 91.600 | 8.2911 |
| 150.0 | 12.5148 | 33.3767 | 25.234 | 276.37 | 0.469 | 0.3158 | 92.190 | 7.5637 |
| 200.0 | 11.0711 | 33.8314 | 25.857 | 218.02 | 0.593 | 0.4002 | 92.570 | 6.7909 |
| 250.0 | 9.1691 | 33.9524 | 26.275 | 178.63 | 0.691 | 0.1678 | 92.620 | 5.8301 |
| 300.0 | 8.3613 | 34.0175 | 26.453 | 162.33 | 0.776 | 0.0916 | 92.590 | 5.6879 |
| 350.0 | 7.3791 | 34.0142 | 26.594 | 149.12 | 0.853 | -0.0561 | 92.590 | 4.8906 |
| 400.0 | 6.6432 | 34.0068 | 26.689 | 140.28 | 0.926 | -0.1635 | 92.600 | 3.9230 |
| 450.0 | 6.0824 | 34.0223 | 26.775 | 132.39 | 0.994 | -0.2245 | 92.600 | 3.1448 |
| 500.0 | 5.6496 | 34.0620 | 26.860 | 124.53 | 1.058 | -0.2471 | 92.620 | 2.1507 |
| 550.0 | 5.1746 | 34.0872 | 26.937 | 117.33 | 1.119 | -0.2837 | 92.630 | 1.5994 |
| 600.0 | 4.9497 | 34.1388 | 27.004 | 111.29 | 1.176 | -0.2690 | 92.640 | 1.0576 |
| 650.0 | 5.0066 | 34.2144 | 27.058 | 106.89 | 1.230 | -0.2034 | 92.620 | 0.5603 |
| 700.0 | 4.7928 | 34.2580 | 27.117 | 101.56 | 1.282 | -0.1933 | 92.640 | 0.3938 |
| 750.0 | 4.5987 | 34.3094 | 27.179 | 95.89 | 1.332 | -0.1745 | 92.650 | 0.2696 |
| 800.0 | 4.4465 | 34.3461 | 27.225 | 91.82 | 1.379 | -0.1623 | 92.650 | 0.2410 |
| 1000.0 | 3.8762 | 34.4483 | 27.368 | 79.21 | 1.549 | -0.1421 | 92.670 | 0.5213 |
| 1008.0 | 3.8727 | 34.4481 | 27.368 | 79.25 | 1.555 | -0.1426 | 92.660 | 0.5334 |

**STATION:** 2 **DATE:** May 3, 1999 0812 UT
**LATITUDE:** 32° 12.98, N. **LONGITUDE:** 126° 47.86 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 14.8291 | 33.3732 | 24.755 | 318.16 | 0.006 | 0.8025 | 91.660 | 8.3362 |
| 5.0 | 14.8306 | 33.3732 | 24.755 | 318.27 | 0.016 | 0.8028 | 91.675 | 8.3275 |
| 10.0 | 14.8405 | 33.3751 | 24.754 | 318.47 | 0.032 | 0.8062 | 91.670 | 8.3073 |
| 15.0 | 14.8435 | 33.3753 | 24.754 | 318.66 | 0.048 | 0.8069 | 91.680 | 8.3123 |
| 20.0 | 14.8485 | 33.3758 | 24.753 | 318.85 | 0.064 | 0.8082 | 91.690 | 8.2938 |
| 25.0 | 14.8404 | 33.3740 | 24.754 | 318.96 | 0.080 | 0.8048 | 91.685 | 8.2934 |
| 30.0 | 14.7528 | 33.3664 | 24.767 | 317.85 | 0.096 | 0.7794 | 91.690 | 8.3084 |
| 40.0 | 14.5837 | 33.3169 | 24.765 | 318.30 | 0.127 | 0.7028 | 91.660 | 8.3162 |
| 50.0 | 14.6737 | 33.3443 | 24.767 | 318.38 | 0.159 | 0.7439 | 91.670 | 8.2830 |
| 60.0 | 14.7518 | 33.3678 | 24.769 | 318.52 | 0.191 | 0.7793 | 91.660 | 8.2436 |
| 70.0 | 14.1444 | 33.2453 | 24.803 | 315.49 | 0.223 | 0.5501 | 91.560 | 8.3481 |
| 80.0 | 14.1358 | 33.2484 | 24.808 | 315.34 | 0.254 | 0.5504 | 91.560 | 8.3042 |
| 100.0 | 13.9978 | 33.2603 | 24.846 | 312.23 | 0.317 | 0.5297 | 91.450 | 8.2839 |
| 150.0 | 12.7958 | 33.6304 | 25.376 | 262.98 | 0.463 | 0.5725 | 92.230 | 7.5693 |
| 200.0 | 9.9846 | 33.7190 | 25.958 | 207.99 | 0.582 | 0.1194 | 92.560 | 6.1555 |
| 250.0 | 9.1170 | 33.9852 | 26.309 | 175.39 | 0.678 | 0.1853 | 92.570 | 6.0657 |
| 300.0 | 8.3652 | 34.0180 | 26.453 | 162.35 | 0.762 | 0.0926 | 92.540 | 5.2350 |
| 350.0 | 7.3394 | 34.0080 | 26.595 | 149.02 | 0.839 | -0.0667 | 92.540 | 4.8451 |
| 400.0 | 6.5022 | 34.0128 | 26.713 | 137.95 | 0.911 | -0.1774 | 92.540 | 3.8024 |
| 450.0 | 5.9629 | 34.0363 | 26.801 | 129.82 | 0.978 | -0.2284 | 92.570 | 2.7982 |
| 500.0 | 5.3589 | 34.0437 | 26.880 | 122.27 | 1.041 | -0.2962 | 92.590 | 2.1620 |
| 550.0 | 5.1995 | 34.1215 | 26.961 | 115.08 | 1.100 | -0.2537 | 92.590 | 1.2674 |
| 600.0 | 5.0809 | 34.1892 | 27.029 | 109.14 | 1.156 | -0.2143 | 92.580 | 0.6592 |
| 650.0 | 4.9324 | 34.2267 | 27.076 | 105.07 | 1.210 | -0.2020 | 92.590 | 0.4651 |
| 700.0 | 4.8322 | 34.2772 | 27.128 | 100.62 | 1.261 | -0.1738 | 92.600 | 0.3194 |
| 750.0 | 4.6115 | 34.3090 | 27.178 | 96.08 | 1.310 | -0.1734 | 92.620 | 0.2430 |
| 800.0 | 4.4394 | 34.3543 | 27.233 | 91.13 | 1.357 | -0.1566 | 92.620 | 0.2393 |
| 1000.0 | 3.8329 | 34.4542 | 27.377 | 78.26 | 1.524 | -0.1417 | 92.630 | 0.5215 |
| 1010.0 | 3.8132 | 34.4559 | 27.380 | 77.99 | 1.532 | -0.1424 | 92.640 | 0.5761 |

**STATION:** 3 **DATE:** May 3, 1999 1021 UT
**LATITUDE:** 32° 21.12 N. **LONGITUDE:** 126° 39.70 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 14.9349 | 33.4359 | 24.780 | 315.73 | 0.006 | 0.8753 | 91.810 | 8.3224 |
| 5.0 | 14.9391 | 33.4366 | 24.780 | 315.85 | 0.016 | 0.8768 | 91.705 | 8.2418 |
| 10.0 | 14.9425 | 33.4361 | 24.779 | 316.09 | 0.032 | 0.8769 | 91.770 | 8.2447 |
| 15.0 | 14.9522 | 33.4380 | 24.779 | 316.29 | 0.047 | 0.8804 | 91.755 | 8.2358 |
| 20.0 | 14.9679 | 33.4435 | 24.780 | 316.34 | 0.063 | 0.8881 | 91.730 | 8.2283 |
| 25.0 | 14.9979 | 33.4594 | 24.786 | 315.93 | 0.079 | 0.9071 | 91.745 | 8.2127 |
| 30.0 | 15.0565 | 33.4849 | 24.793 | 315.41 | 0.095 | 0.9400 | 91.750 | 8.2069 |
| 40.0 | 15.1515 | 33.5323 | 24.809 | 314.19 | 0.126 | 0.9982 | 91.790 | 8.1737 |
| 50.0 | 15.1449 | 33.5339 | 24.812 | 314.21 | 0.158 | 0.9976 | 91.770 | 8.1577 |
| 60.0 | 15.1418 | 33.5334 | 24.812 | 314.45 | 0.189 | 0.9962 | 91.770 | 8.1503 |
| 70.0 | 15.1325 | 33.5320 | 24.814 | 314.64 | 0.221 | 0.9927 | 91.780 | 8.1367 |
| 80.0 | 15.1217 | 33.5292 | 24.814 | 314.89 | 0.252 | 0.9878 | 91.780 | 8.1347 |
| 100.0 | 15.0382 | 33.5161 | 24.823 | 314.65 | 0.315 | 0.9582 | 91.760 | 8.1264 |
| 150.0 | 13.1295 | 33.7327 | 25.389 | 261.83 | 0.460 | 0.7206 | 92.320 | 7.3890 |
| 200.0 | 10.1563 | 33.8994 | 26.070 | 197.48 | 0.575 | 0.2917 | 92.650 | 6.2515 |
| 250.0 | 9.1298 | 34.0201 | 26.334 | 173.01 | 0.666 | 0.2150 | 92.580 | 6.2911 |
| 300.0 | 8.0768 | 34.0170 | 26.495 | 158.15 | 0.749 | 0.0482 | 92.490 | 4.7332 |
| 350.0 | 7.4821 | 34.0234 | 26.587 | 149.89 | 0.825 | -0.0342 | 92.530 | 4.5832 |
| 400.0 | 6.5927 | 33.9933 | 26.685 | 140.60 | 0.898 | -0.1809 | 92.550 | 4.1366 |
| 450.0 | 6.0707 | 34.0288 | 26.781 | 131.76 | 0.966 | -0.2208 | 92.570 | 2.9463 |
| 500.0 | 5.5127 | 34.0584 | 26.874 | 123.08 | 1.030 | -0.2664 | 92.570 | 2.0476 |
| 550.0 | 5.1530 | 34.0890 | 26.940 | 116.93 | 1.090 | -0.2848 | 92.590 | 1.4814 |
| 600.0 | 4.9015 | 34.1457 | 27.015 | 110.20 | 1.147 | -0.2690 | 92.590 | 0.9419 |
| 650.0 | 4.8004 | 34.2097 | 27.077 | 104.73 | 1.200 | -0.2301 | 92.600 | 0.5186 |
| 700.0 | 4.7401 | 34.2743 | 27.136 | 99.71 | 1.251 | -0.1863 | 92.590 | 0.3061 |
| 750.0 | 4.6912 | 34.3250 | 27.182 | 95.86 | 1.300 | -0.1521 | 92.590 | 0.2382 |
| 800.0 | 4.4614 | 34.3489 | 27.226 | 91.79 | 1.347 | -0.1585 | 92.620 | 0.2222 |
| 1000.0 | 3.8831 | 34.4495 | 27.368 | 79.21 | 1.517 | -0.1405 | 92.620 | 0.4732 |
| 1008.0 | 3.8622 | 34.4517 | 27.372 | 78.86 | 1.524 | -0.1409 | 92.630 | 0.5083 |

**STATION:** 4 **DATE:** May 3, 1999 1231 UT
**LATITUDE:** 32° 29.04 N. **LONGITUDE:** 126° 31.51 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 14.3984 | 33.2691 | 24.766 | 317.06 | 0.006 | 0.6259 | 91.580 | 8.4238 |
| 5.0 | 14.3980 | 33.2690 | 24.767 | 317.15 | 0.016 | 0.6256 | 91.585 | 8.4151 |
| 10.0 | 14.3989 | 33.2689 | 24.766 | 317.30 | 0.032 | 0.6256 | 91.650 | 8.4007 |
| 15.0 | 14.4013 | 33.2688 | 24.766 | 317.48 | 0.048 | 0.6259 | 91.640 | 8.4022 |
| 20.0 | 14.4020 | 33.2688 | 24.766 | 317.63 | 0.063 | 0.6258 | 91.610 | 8.3853 |
| 25.0 | 14.4020 | 33.2691 | 24.766 | 317.74 | 0.079 | 0.6259 | 91.655 | 8.3853 |
| 30.0 | 14.4041 | 33.2690 | 24.766 | 317.92 | 0.095 | 0.6261 | 91.630 | 8.3720 |
| 40.0 | 14.4128 | 33.2847 | 24.777 | 317.20 | 0.127 | 0.6401 | 91.610 | 8.3424 |
| 50.0 | 14.4088 | 33.2850 | 24.778 | 317.36 | 0.159 | 0.6392 | 91.590 | 8.3284 |
| 60.0 | 14.4196 | 33.2882 | 24.778 | 317.60 | 0.190 | 0.6438 | 91.590 | 8.3021 |
| 70.0 | 14.4524 | 33.2985 | 24.780 | 317.77 | 0.222 | 0.6587 | 91.570 | 8.2840 |
| 80.0 | 14.5428 | 33.3306 | 24.786 | 317.51 | 0.254 | 0.7035 | 91.570 | 8.2462 |
| 100.0 | 14.9288 | 33.5362 | 24.862 | 310.90 | 0.317 | 0.9497 | 91.530 | 8.1156 |
| 150.0 | 12.4480 | 33.4331 | 25.291 | 270.98 | 0.465 | 0.3473 | 92.180 | 7.4443 |
| 200.0 | 10.6492 | 33.7803 | 25.892 | 214.53 | 0.585 | 0.2838 | 92.500 | 6.3043 |
| 250.0 | 9.1588 | 33.9874 | 26.304 | 175.88 | 0.681 | 0.1938 | 92.540 | 6.1052 |
| 300.0 | 8.1732 | 34.0154 | 26.479 | 159.68 | 0.765 | 0.0614 | 92.500 | 4.8517 |
| 350.0 | 7.1424 | 33.9983 | 26.615 | 146.99 | 0.841 | -0.1019 | 92.540 | 4.6959 |
| 400.0 | 6.6178 | 34.0237 | 26.706 | 138.68 | 0.913 | -0.1535 | 92.490 | 3.5298 |
| 450.0 | 5.8506 | 34.0333 | 26.812 | 128.61 | 0.980 | -0.2447 | 92.520 | 2.5448 |
| 500.0 | 5.6225 | 34.0866 | 26.883 | 122.36 | 1.043 | -0.2309 | 92.520 | 1.8027 |
| 550.0 | 5.4619 | 34.1713 | 26.970 | 114.63 | 1.102 | -0.1837 | 92.500 | 0.9106 |
| 600.0 | 5.1108 | 34.1963 | 27.031 | 108.98 | 1.158 | -0.2053 | 92.520 | 0.6063 |
| 650.0 | 4.9630 | 34.2438 | 27.086 | 104.17 | 1.212 | -0.1851 | 92.530 | 0.3943 |
| 700.0 | 4.5742 | 34.2609 | 27.143 | 98.72 | 1.262 | -0.2149 | 92.560 | 0.2612 |
| 750.0 | 4.4732 | 34.3092 | 27.193 | 94.40 | 1.311 | -0.1881 | 92.590 | 0.1947 |
| 800.0 | 4.2932 | 34.3369 | 27.234 | 90.67 | 1.357 | -0.1857 | 92.580 | 0.1632 |
| 1000.0 | 3.8578 | 34.4444 | 27.366 | 79.28 | 1.527 | -0.1470 | 92.590 | 0.4567 |
| 1010.0 | 3.8310 | 34.4452 | 27.370 | 78.99 | 1.534 | -0.1490 | 92.590 | 0.4740 |

**STATION:** 5 **DATE:** May 3, 1999 1434 UT
**LATITUDE:** 32° 37.13 N. **LONGITUDE:** 126° 23.40 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 14.4302 | 33.2765 | 24.765 | 317.16 | 0.006 | 0.6386 | 91.650 | 8.6477 |
| 5.0 | 14.4270 | 33.2780 | 24.767 | 317.07 | 0.016 | 0.6390 | 91.630 | 8.5113 |
| 10.0 | 14.4286 | 33.2780 | 24.767 | 317.23 | 0.032 | 0.6392 | 91.640 | 8.5180 |
| 15.0 | 14.4299 | 33.2775 | 24.767 | 317.42 | 0.048 | 0.6390 | 91.650 | 8.5096 |
| 20.0 | 14.4308 | 33.2776 | 24.767 | 317.56 | 0.063 | 0.6391 | 91.650 | 8.4682 |
| 25.0 | 14.4309 | 33.2775 | 24.767 | 317.71 | 0.079 | 0.6388 | 91.640 | 8.4569 |
| 30.0 | 14.4325 | 33.2778 | 24.767 | 317.84 | 0.095 | 0.6393 | 91.650 | 8.4250 |
| 40.0 | 14.4345 | 33.2776 | 24.767 | 318.16 | 0.127 | 0.6392 | 91.650 | 8.4035 |
| 50.0 | 14.4287 | 33.2774 | 24.768 | 318.32 | 0.159 | 0.6375 | 91.640 | 8.3758 |
| 60.0 | 14.4276 | 33.2769 | 24.768 | 318.59 | 0.191 | 0.6366 | 91.630 | 8.3546 |
| 70.0 | 14.4151 | 33.2768 | 24.771 | 318.61 | 0.223 | 0.6335 | 91.610 | 8.3282 |
| 80.0 | 14.3812 | 33.2758 | 24.778 | 318.26 | 0.254 | 0.6250 | 91.650 | 8.3160 |
| 100.0 | 14.1665 | 33.3408 | 24.873 | 309.69 | 0.317 | 0.6295 | 91.250 | 8.2676 |
| 150.0 | 12.5829 | 33.5200 | 25.332 | 267.10 | 0.465 | 0.4428 | 92.180 | 7.3121 |
| 200.0 | 9.7550 | 33.7469 | 26.018 | 202.20 | 0.582 | 0.1026 | 92.430 | 5.7971 |
| 250.0 | 8.8987 | 34.0141 | 26.366 | 169.86 | 0.673 | 0.1733 | 92.470 | 5.7560 |
| 300.0 | 7.9283 | 34.0346 | 26.531 | 154.67 | 0.754 | 0.0401 | 92.430 | 4.4840 |
| 350.0 | 7.3554 | 34.0470 | 26.623 | 146.35 | 0.830 | -0.0335 | 92.440 | 3.7850 |
| 400.0 | 6.8367 | 34.0927 | 26.731 | 136.51 | 0.901 | -0.0696 | 92.420 | 2.5951 |
| 450.0 | 5.9507 | 34.0584 | 26.820 | 128.02 | 0.966 | -0.2124 | 92.470 | 2.2618 |
| 500.0 | 5.6794 | 34.1132 | 26.897 | 121.10 | 1.028 | -0.2030 | 92.450 | 1.4578 |
| 550.0 | 5.4287 | 34.1385 | 26.947 | 116.65 | 1.088 | -0.2135 | 92.450 | 1.0885 |
| 600.0 | 5.2086 | 34.1824 | 27.009 | 111.22 | 1.145 | -0.2051 | 92.470 | 0.7424 |
| 650.0 | 4.8946 | 34.2182 | 27.073 | 105.24 | 1.199 | -0.2130 | 92.490 | 0.4877 |
| 700.0 | 4.6807 | 34.2515 | 27.124 | 100.69 | 1.250 | -0.2108 | 92.520 | 0.3691 |
| 750.0 | 4.6380 | 34.3153 | 27.180 | 95.93 | 1.299 | -0.1656 | 92.470 | 0.1821 |
| 800.0 | 4.4720 | 34.3464 | 27.223 | 92.11 | 1.346 | -0.1594 | 92.500 | 0.1883 |
| 1000.0 | 3.7892 | 34.4421 | 27.371 | 78.64 | 1.517 | -0.1555 | 92.540 | 0.4135 |
| 1200.0 | 3.2935 | 34.5057 | 27.471 | 69.63 | 1.664 | -0.1540 | 92.550 | 0.8363 |
| 1400.0 | 2.9251 | 34.5432 | 27.536 | 63.86 | 1.798 | -0.1589 | 92.570 | 1.2489 |
| 1600.0 | 2.6463 | 34.5701 | 27.583 | 59.75 | 1.921 | -0.1629 | 92.570 | 1.5624 |
| 1800.0 | 2.3600 | 34.5923 | 27.626 | 55.72 | 2.036 | -0.1700 | 92.580 | 1.8850 |
| 2000.0 | 2.1107 | 34.6135 | 27.664 | 52.05 | 2.144 | -0.1740 | 92.570 | 2.2636 |
| 2200.0 | 1.9465 | 34.6282 | 27.690 | 49.76 | 2.245 | -0.1761 | 92.570 | 2.5852 |
| 2400.0 | 1.8360 | 34.6399 | 27.709 | 48.26 | 2.343 | -0.1762 | 92.570 | 2.8733 |
| 2600.0 | 1.7397 | 34.6499 | 27.725 | 46.98 | 2.438 | -0.1765 | 92.570 | 3.1635 |
| 2800.0 | 1.6577 | 34.6578 | 27.739 | 45.96 | 2.531 | -0.1774 | 92.570 | 3.4380 |
| 3000.0 | 1.6045 | 34.6631 | 27.748 | 45.47 | 2.623 | -0.1782 | 92.570 | 3.6304 |
| 3200.0 | 1.5597 | 34.6681 | 27.757 | 45.07 | 2.713 | -0.1786 | 92.550 | 3.8226 |
| 3400.0 | 1.5171 | 34.6739 | 27.766 | 44.60 | 2.803 | -0.1783 | 92.540 | 4.0633 |
| 3600.0 | 1.4949 | 34.6780 | 27.772 | 44.53 | 2.892 | -0.1779 | 92.540 | 4.2835 |
| 3800.0 | 1.4824 | 34.6814 | 27.777 | 44.63 | 2.981 | -0.1775 | 92.520 | 4.4900 |
| 4000.0 | 1.4877 | 34.6836 | 27.780 | 45.08 | 3.071 | -0.1769 | 92.520 | 4.6144 |
| 4200.0 | 1.5000 | 34.6847 | 27.781 | 45.72 | 3.162 | -0.1767 | 92.480 | 4.6948 |
| 4314.0 | 1.5101 | 34.6855 | 27.782 | 46.12 | 3.214 | -0.1762 | 92.450 | 4.7261 |

**STATION:** 6 **DATE:** May 3, 1999 1827 UT
**LATITUDE:** 32° 45.27 N. **LONGITUDE:** 126° 15.23 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 14.5170 | 33.2736 | 24.745 | 319.12 | 0.006 | 0.6553 | 91.700 | 9.3460 |
| 5.0 | 14.5173 | 33.2719 | 24.744 | 319.34 | 0.016 | 0.6538 | 91.300 | 9.1987 |
| 10.0 | 14.4943 | 33.2719 | 24.749 | 319.00 | 0.032 | 0.6487 | 91.450 | 9.1736 |
| 15.0 | 14.4640 | 33.2719 | 24.755 | 318.52 | 0.048 | 0.6420 | 91.440 | 9.1510 |
| 20.0 | 14.4288 | 33.2716 | 24.763 | 317.96 | 0.064 | 0.6339 | 91.390 | 9.1208 |
| 25.0 | 14.4136 | 33.2710 | 24.765 | 317.83 | 0.080 | 0.6300 | 91.375 | 9.0907 |
| 30.0 | 14.4066 | 33.2706 | 24.767 | 317.85 | 0.096 | 0.6280 | 91.380 | 9.0638 |
| 40.0 | 14.3842 | 33.2683 | 24.770 | 317.83 | 0.127 | 0.6210 | 91.400 | 8.9733 |
| 50.0 | 14.3754 | 33.2671 | 24.771 | 318.00 | 0.159 | 0.6178 | 91.410 | 8.9043 |
| 60.0 | 14.3577 | 33.2655 | 24.774 | 318.02 | 0.191 | 0.6124 | 91.370 | 8.8304 |
| 70.0 | 14.3247 | 33.2637 | 24.780 | 317.75 | 0.223 | 0.6035 | 91.380 | 8.7732 |
| 80.0 | 13.6829 | 33.2480 | 24.901 | 306.42 | 0.254 | 0.4539 | 90.630 | 8.8434 |
| 100.0 | 14.4117 | 33.5881 | 25.013 | 296.49 | 0.314 | 0.8774 | 91.170 | 8.3889 |
| 150.0 | 10.7380 | 33.5884 | 25.726 | 229.17 | 0.449 | 0.1486 | 92.280 | 6.5716 |
| 200.0 | 9.1294 | 33.8965 | 26.237 | 181.22 | 0.549 | 0.1180 | 92.350 | 5.7352 |
| 250.0 | 8.2456 | 34.0064 | 26.461 | 160.58 | 0.634 | 0.0660 | 92.330 | 4.9142 |
| 300.0 | 7.5896 | 34.0457 | 26.588 | 148.98 | 0.711 | -0.0005 | 92.330 | 3.7708 |
| 350.0 | 6.9774 | 34.0544 | 26.681 | 140.56 | 0.784 | -0.0802 | 92.340 | 3.2118 |
| 400.0 | 6.4727 | 34.0731 | 26.764 | 133.08 | 0.852 | -0.1335 | 92.350 | 2.4640 |
| 450.0 | 6.0275 | 34.0968 | 26.840 | 126.15 | 0.917 | -0.1724 | 92.350 | 1.7682 |
| 500.0 | 5.6810 | 34.1252 | 26.906 | 120.23 | 0.978 | -0.1933 | 92.400 | 1.4057 |
| 550.0 | 5.4673 | 34.1799 | 26.976 | 114.06 | 1.037 | -0.1762 | 92.370 | 0.7901 |
| 600.0 | 5.2437 | 34.2295 | 27.042 | 108.15 | 1.092 | -0.1638 | 92.380 | 0.4807 |
| 650.0 | 4.9125 | 34.2556 | 27.101 | 102.68 | 1.145 | -0.1814 | 92.420 | 0.3253 |
| 700.0 | 4.5786 | 34.2731 | 27.152 | 97.86 | 1.195 | -0.2048 | 92.470 | 0.2572 |
| 750.0 | 4.4503 | 34.3055 | 27.192 | 94.41 | 1.243 | -0.1934 | 92.460 | 0.1988 |
| 800.0 | 4.3054 | 34.3538 | 27.247 | 89.56 | 1.289 | -0.1711 | 92.460 | 0.1899 |
| 1000.0 | 3.7551 | 34.4486 | 27.380 | 77.76 | 1.456 | -0.1537 | 92.460 | 0.4358 |
| 1010.0 | 3.7430 | 34.4502 | 27.382 | 77.58 | 1.463 | -0.1537 | 92.470 | 0.4579 |

**STATION:** 7 **DATE:** May 3, 1999 2031 UT
**LATITUDE:** 32° 53.21 N. **LONGITUDE:** 126° 06.95 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 14.1522 | 33.2112 | 24.773 | 316.40 | 0.006 | 0.5268 | 90.780 | 8.8065 |
| 5.0 | 14.1716 | 33.2099 | 24.768 | 316.96 | 0.016 | 0.5299 | 90.660 | 8.8078 |
| 10.0 | 14.1736 | 33.2115 | 24.769 | 317.01 | 0.032 | 0.5314 | 90.800 | 8.8061 |
| 15.0 | 14.1342 | 33.2114 | 24.778 | 316.36 | 0.048 | 0.5228 | 90.730 | 8.8239 |
| 20.0 | 14.0912 | 33.2109 | 24.786 | 315.67 | 0.063 | 0.5130 | 90.640 | 8.8079 |
| 25.0 | 14.0609 | 33.2104 | 24.793 | 315.23 | 0.079 | 0.5060 | 90.570 | 8.8057 |
| 30.0 | 14.0554 | 33.2098 | 24.793 | 315.30 | 0.095 | 0.5041 | 90.520 | 8.7914 |
| 40.0 | 14.0390 | 33.2095 | 24.797 | 315.25 | 0.126 | 0.5001 | 90.500 | 8.7648 |
| 50.0 | 14.0206 | 33.2090 | 24.800 | 315.18 | 0.158 | 0.4954 | 90.470 | 8.7567 |
| 60.0 | 14.0038 | 33.2084 | 24.804 | 315.15 | 0.189 | 0.4911 | 90.510 | 8.7563 |
| 70.0 | 13.9701 | 33.2060 | 24.809 | 314.91 | 0.221 | 0.4817 | 90.610 | 8.7281 |
| 80.0 | 13.6190 | 33.2370 | 24.905 | 305.99 | 0.252 | 0.4318 | 90.530 | 8.7272 |
| 100.0 | 13.6292 | 33.2620 | 24.923 | 304.84 | 0.313 | 0.4532 | 90.580 | 8.6190 |
| 150.0 | 10.8195 | 33.5469 | 25.679 | 233.61 | 0.450 | 0.1303 | 92.110 | 6.3081 |
| 200.0 | 9.2195 | 33.8520 | 26.188 | 185.92 | 0.553 | 0.0974 | 92.300 | 5.5904 |
| 250.0 | 8.3199 | 33.9919 | 26.438 | 162.75 | 0.639 | 0.0658 | 92.260 | 4.8696 |
| 300.0 | 7.5379 | 34.0363 | 26.588 | 148.94 | 0.716 | -0.0153 | 92.270 | 3.8909 |
| 350.0 | 6.7322 | 34.0345 | 26.699 | 138.72 | 0.788 | -0.1291 | 92.270 | 3.2953 |
| 400.0 | 6.3516 | 34.0596 | 26.769 | 132.48 | 0.856 | -0.1600 | 92.280 | 2.4985 |
| 450.0 | 5.9333 | 34.0744 | 26.834 | 126.60 | 0.921 | -0.2019 | 92.300 | 1.9774 |
| 500.0 | 5.4057 | 34.0841 | 26.907 | 119.84 | 0.982 | -0.2587 | 92.350 | 1.6495 |
| 550.0 | 5.3201 | 34.1618 | 26.979 | 113.57 | 1.041 | -0.2079 | 92.310 | 0.8270 |
| 600.0 | 5.0686 | 34.2165 | 27.052 | 106.96 | 1.095 | -0.1942 | 92.350 | 0.4825 |
| 650.0 | 4.6996 | 34.2416 | 27.114 | 101.15 | 1.147 | -0.2160 | 92.370 | 0.3341 |
| 700.0 | 4.6443 | 34.3004 | 27.167 | 96.62 | 1.197 | -0.1762 | 92.350 | 0.2121 |
| 750.0 | 4.4847 | 34.3381 | 27.214 | 92.40 | 1.244 | -0.1641 | 92.360 | 0.1691 |
| 800.0 | 4.3299 | 34.3776 | 27.263 | 88.09 | 1.289 | -0.1498 | 92.350 | 0.1747 |
| 1000.0 | 3.7580 | 34.4551 | 27.385 | 77.31 | 1.454 | -0.1483 | 92.340 | 0.4076 |
| 1010.0 | 3.7275 | 34.4575 | 27.390 | 76.86 | 1.462 | -0.1495 | 92.350 | 0.4293 |

**STATION:** 8 **DATE:** May 3, 1999 2236 UT
**LATITUDE:** 33° 01.20 N. **LONGITUDE:** 125° 58.67 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 14.1893 | 33.1875 | 24.747 | 318.88 | 0.006 | 0.5160 | 90.610 | 8.7446 |
| 5.0 | 14.1833 | 33.1866 | 24.748 | 318.90 | 0.016 | 0.5139 | 90.735 | 8.7477 |
| 10.0 | 14.1706 | 33.1873 | 24.751 | 318.73 | 0.032 | 0.5116 | 90.720 | 8.7716 |
| 15.0 | 14.1279 | 33.1870 | 24.760 | 318.03 | 0.048 | 0.5021 | 90.700 | 8.7740 |
| 20.0 | 14.1110 | 33.1872 | 24.764 | 317.81 | 0.064 | 0.4984 | 90.700 | 8.7768 |
| 25.0 | 14.0527 | 33.1878 | 24.777 | 316.74 | 0.080 | 0.4862 | 90.650 | 8.7474 |
| 30.0 | 14.0272 | 33.1868 | 24.781 | 316.43 | 0.095 | 0.4799 | 90.630 | 8.7108 |
| 40.0 | 14.0185 | 33.1868 | 24.783 | 316.52 | 0.127 | 0.4777 | 90.610 | 8.6985 |
| 50.0 | 14.0128 | 33.1870 | 24.785 | 316.64 | 0.159 | 0.4763 | 90.630 | 8.6831 |
| 60.0 | 14.0029 | 33.1872 | 24.788 | 316.69 | 0.190 | 0.4741 | 90.640 | 8.6734 |
| 70.0 | 13.9622 | 33.1878 | 24.797 | 316.09 | 0.222 | 0.4656 | 90.760 | 8.6680 |
| 80.0 | 13.6129 | 33.2087 | 24.885 | 307.95 | 0.253 | 0.4081 | 90.550 | 8.6977 |
| 100.0 | 13.5155 | 33.2076 | 24.904 | 306.63 | 0.315 | 0.3863 | 90.360 | 8.6003 |
| 150.0 | 11.2004 | 33.5237 | 25.593 | 241.88 | 0.451 | 0.1813 | 92.060 | 6.6918 |
| 200.0 | 9.3995 | 33.8463 | 26.154 | 189.17 | 0.558 | 0.1222 | 92.250 | 5.7810 |
| 250.0 | 8.5175 | 33.9787 | 26.398 | 166.68 | 0.645 | 0.0856 | 92.210 | 4.9227 |
| 300.0 | 7.7218 | 34.0148 | 26.545 | 153.16 | 0.725 | -0.0058 | 92.190 | 4.3294 |
| 350.0 | 7.1511 | 34.0276 | 26.636 | 144.94 | 0.800 | -0.0775 | 92.210 | 3.7980 |
| 400.0 | 6.4081 | 34.0158 | 26.727 | 136.48 | 0.870 | -0.1873 | 92.250 | 3.4082 |
| 450.0 | 5.9473 | 34.0499 | 26.813 | 128.60 | 0.936 | -0.2196 | 92.260 | 2.4467 |
| 500.0 | 5.4959 | 34.0826 | 26.895 | 121.07 | 0.999 | -0.2492 | 92.280 | 1.8313 |
| 550.0 | 5.0644 | 34.1135 | 26.970 | 114.04 | 1.058 | -0.2755 | 92.300 | 1.2229 |
| 600.0 | 5.0698 | 34.2138 | 27.049 | 107.18 | 1.113 | -0.1962 | 92.270 | 0.5580 |
| 650.0 | 4.9173 | 34.2586 | 27.103 | 102.52 | 1.165 | -0.1785 | 92.260 | 0.3101 |
| 700.0 | 4.7044 | 34.2928 | 27.154 | 97.91 | 1.215 | -0.1756 | 92.280 | 0.2260 |
| 750.0 | 4.6507 | 34.3376 | 27.196 | 94.43 | 1.264 | -0.1466 | 92.240 | 0.1672 |
| 800.0 | 4.4209 | 34.3564 | 27.236 | 90.75 | 1.310 | -0.1569 | 92.250 | 0.1559 |
| 1000.0 | 3.7773 | 34.4528 | 27.381 | 77.71 | 1.477 | -0.1483 | 92.280 | 0.3937 |
| 1012.0 | 3.7381 | 34.4556 | 27.387 | 77.14 | 1.486 | -0.1500 | 92.280 | 0.4128 |

**STATION:** 9 **DATE:** May 4, 1999 0044 UT
**LATITUDE:** 33° 09.21 N. **LONGITUDE:** 125° 50.43 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 14.3303 | 33.2432 | 24.761 | 317.60 | 0.006 | 0.5906 | 90.770 | 8.5304 |
| 5.0 | 14.3282 | 33.2430 | 24.761 | 317.65 | 0.016 | 0.5899 | 90.805 | 8.5114 |
| 10.0 | 14.3272 | 33.2428 | 24.761 | 317.78 | 0.032 | 0.5894 | 90.870 | 8.4744 |
| 15.0 | 14.3139 | 33.2423 | 24.764 | 317.68 | 0.048 | 0.5859 | 90.870 | 8.4610 |
| 20.0 | 14.2678 | 33.2400 | 24.772 | 317.05 | 0.064 | 0.5740 | 90.880 | 8.4584 |
| 25.0 | 14.2260 | 33.2388 | 24.780 | 316.44 | 0.079 | 0.5638 | 90.830 | 8.4433 |
| 30.0 | 14.1656 | 33.2375 | 24.792 | 315.45 | 0.095 | 0.5497 | 90.800 | 8.4313 |
| 40.0 | 14.1563 | 33.2396 | 24.796 | 315.37 | 0.127 | 0.5491 | 90.700 | 8.4063 |
| 50.0 | 14.1524 | 33.2396 | 24.797 | 315.55 | 0.158 | 0.5479 | 90.640 | 8.3788 |
| 60.0 | 14.1486 | 33.2399 | 24.798 | 315.71 | 0.190 | 0.5470 | 90.720 | 8.3553 |
| 70.0 | 14.1462 | 33.2428 | 24.801 | 315.71 | 0.221 | 0.5485 | 90.770 | 8.3251 |
| 80.0 | 13.6343 | 33.1710 | 24.851 | 311.13 | 0.253 | 0.3827 | 90.530 | 8.3995 |
| 100.0 | 13.4378 | 33.1444 | 24.871 | 309.77 | 0.315 | 0.3199 | 90.140 | 8.3593 |
| 150.0 | 11.0972 | 33.5341 | 25.620 | 239.33 | 0.453 | 0.1706 | 91.930 | 6.7491 |
| 200.0 | 9.0771 | 33.8833 | 26.235 | 181.39 | 0.555 | 0.0991 | 92.200 | 5.2474 |
| 250.0 | 8.3299 | 33.9881 | 26.434 | 163.18 | 0.641 | 0.0643 | 92.150 | 4.7312 |
| 300.0 | 7.7554 | 34.0094 | 26.536 | 154.04 | 0.720 | -0.0052 | 92.130 | 4.4060 |
| 350.0 | 6.8703 | 34.0129 | 26.663 | 142.18 | 0.794 | -0.1276 | 92.160 | 3.8909 |
| 400.0 | 6.1351 | 34.0280 | 26.772 | 132.02 | 0.862 | -0.2127 | 92.190 | 2.9434 |
| 450.0 | 5.7811 | 34.0776 | 26.856 | 124.43 | 0.927 | -0.2182 | 92.200 | 1.9499 |
| 500.0 | 5.3883 | 34.1041 | 26.925 | 118.14 | 0.988 | -0.2450 | 92.200 | 1.3981 |
| 550.0 | 4.9411 | 34.1136 | 26.984 | 112.55 | 1.045 | -0.2894 | 92.250 | 1.2104 |
| 600.0 | 4.8969 | 34.1937 | 27.053 | 106.57 | 1.100 | -0.2316 | 92.230 | 0.6124 |
| 650.0 | 4.8285 | 34.2613 | 27.115 | 101.24 | 1.152 | -0.1863 | 92.210 | 0.3167 |
| 700.0 | 4.6660 | 34.3199 | 27.180 | 95.43 | 1.201 | -0.1584 | 92.200 | 0.1883 |
| 750.0 | 4.5187 | 34.3596 | 27.228 | 91.21 | 1.248 | -0.1435 | 92.180 | 0.1716 |
| 800.0 | 4.3637 | 34.3792 | 27.261 | 88.37 | 1.293 | -0.1450 | 92.200 | 0.1785 |
| 1000.0 | 3.7530 | 34.4583 | 27.388 | 77.02 | 1.457 | -0.1463 | 92.210 | 0.4337 |
| 1200.0 | 3.2637 | 34.5109 | 27.478 | 68.90 | 1.603 | -0.1527 | 91.710 | 0.8179 |
| 1400.0 | 2.8791 | 34.5454 | 27.542 | 63.16 | 1.735 | -0.1611 | 92.230 | 1.1507 |
| 1600.0 | 2.5161 | 34.5719 | 27.596 | 58.07 | 1.856 | -0.1721 | 92.230 | 1.5091 |
| 1800.0 | 2.2250 | 34.5961 | 27.640 | 53.82 | 1.967 | -0.1776 | 92.230 | 1.8886 |
| 2000.0 | 2.0196 | 34.6195 | 27.676 | 50.50 | 2.071 | -0.1762 | 92.230 | 2.3607 |
| 2200.0 | 1.8718 | 34.6328 | 27.699 | 48.49 | 2.170 | -0.1779 | 92.250 | 2.6489 |
| 2400.0 | 1.7746 | 34.6422 | 27.715 | 47.30 | 2.266 | -0.1788 | 92.280 | 2.9046 |
| 2600.0 | 1.6877 | 34.6539 | 27.732 | 46.00 | 2.359 | -0.1770 | 92.280 | 3.2675 |
| 2800.0 | 1.6268 | 34.6602 | 27.743 | 45.37 | 2.450 | -0.1776 | 92.280 | 3.4779 |
| 3000.0 | 1.5823 | 34.6650 | 27.751 | 45.02 | 2.541 | -0.1782 | 92.270 | 3.6504 |
| 3200.0 | 1.5317 | 34.6706 | 27.761 | 44.49 | 2.630 | -0.1785 | 92.260 | 3.8739 |
| 3400.0 | 1.5004 | 34.6752 | 27.768 | 44.26 | 2.719 | -0.1784 | 92.250 | 4.1077 |
| 3600.0 | 1.4883 | 34.6787 | 27.773 | 44.38 | 2.808 | -0.1778 | 92.250 | 4.2876 |
| 3800.0 | 1.4828 | 34.6816 | 27.777 | 44.62 | 2.897 | -0.1773 | 92.250 | 4.4458 |
| 4000.0 | 1.4892 | 34.6834 | 27.779 | 45.11 | 2.986 | -0.1769 | 92.230 | 4.5510 |
| 4200.0 | 1.5027 | 34.6845 | 27.781 | 45.77 | 3.077 | -0.1766 | 92.210 | 4.6262 |
| 4400.0 | 1.5210 | 34.6852 | 27.782 | 46.54 | 3.169 | -0.1764 | 92.180 | 4.6926 |
| 4498.0 | 1.5304 | 34.6855 | 27.782 | 46.93 | 3.215 | -0.1763 | 92.160 | 4.6741 |

**STATION:** 10 **DATE:** May 4, 1999 0646 UT
**LATITUDE:** 33° 17.30 N. **LONGITUDE:** 125° 42.29 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 14.2625 | 33.2583 | 24.787 | 315.14 | 0.006 | 0.5879 | 90.830 | 8.4001 |
| 5.0 | 14.2627 | 33.2584 | 24.787 | 315.21 | 0.016 | 0.5879 | 90.820 | 8.3893 |
| 10.0 | 14.2625 | 33.2576 | 24.786 | 315.39 | 0.032 | 0.5871 | 90.770 | 8.3773 |
| 15.0 | 14.2729 | 33.2633 | 24.789 | 315.32 | 0.047 | 0.5936 | 90.740 | 8.3701 |
| 20.0 | 14.2875 | 33.2861 | 24.803 | 314.06 | 0.063 | 0.6147 | 90.840 | 8.3542 |
| 25.0 | 14.2618 | 33.3144 | 24.831 | 311.60 | 0.079 | 0.6314 | 90.780 | 8.3377 |
| 30.0 | 14.2472 | 33.3137 | 24.834 | 311.49 | 0.094 | 0.6276 | 90.770 | 8.3200 |
| 40.0 | 14.2350 | 33.3130 | 24.836 | 311.55 | 0.125 | 0.6241 | 90.710 | 8.2817 |
| 50.0 | 14.2148 | 33.3119 | 24.840 | 311.49 | 0.157 | 0.6185 | 90.650 | 8.2610 |
| 60.0 | 14.2047 | 33.3116 | 24.842 | 311.57 | 0.188 | 0.6158 | 90.660 | 8.2263 |
| 70.0 | 14.1955 | 33.3103 | 24.843 | 311.73 | 0.219 | 0.6125 | 90.730 | 8.1982 |
| 80.0 | 14.1860 | 33.3085 | 24.844 | 311.93 | 0.250 | 0.6087 | 90.780 | 8.1776 |
| 100.0 | 14.0508 | 33.3114 | 24.875 | 309.53 | 0.312 | 0.5815 | 90.910 | 8.1507 |
| 150.0 | 10.4809 | 33.6218 | 25.797 | 222.37 | 0.443 | 0.1294 | 91.950 | 6.2075 |
| 200.0 | 8.8171 | 33.9313 | 26.313 | 173.84 | 0.540 | 0.0957 | 92.050 | 5.0849 |
| 250.0 | 8.0751 | 34.0075 | 26.487 | 157.99 | 0.623 | 0.0412 | 91.990 | 4.6058 |
| 300.0 | 7.3555 | 34.0203 | 26.602 | 147.57 | 0.699 | -0.0540 | 91.990 | 4.1876 |
| 350.0 | 6.7087 | 34.0245 | 26.694 | 139.14 | 0.771 | -0.1402 | 91.990 | 3.5954 |
| 400.0 | 6.0831 | 34.0373 | 26.786 | 130.65 | 0.839 | -0.2119 | 92.030 | 2.6563 |
| 450.0 | 5.6031 | 34.0524 | 26.857 | 124.07 | 0.903 | -0.2597 | 92.050 | 2.1275 |
| 500.0 | 5.3130 | 34.0863 | 26.919 | 118.54 | 0.964 | -0.2679 | 92.040 | 1.5715 |
| 550.0 | 4.9964 | 34.1230 | 26.985 | 112.51 | 1.022 | -0.2757 | 92.070 | 1.1192 |
| 600.0 | 4.8460 | 34.1811 | 27.049 | 106.90 | 1.077 | -0.2472 | 92.070 | 0.6321 |
| 650.0 | 4.7485 | 34.2451 | 27.111 | 101.48 | 1.128 | -0.2079 | 92.070 | 0.3492 |
| 700.0 | 4.6117 | 34.2953 | 27.166 | 96.61 | 1.178 | -0.1837 | 92.040 | 0.1995 |
| 750.0 | 4.5721 | 34.3422 | 27.208 | 93.14 | 1.225 | -0.1515 | 92.010 | 0.1519 |
| 800.0 | 4.4236 | 34.3703 | 27.247 | 89.75 | 1.271 | -0.1457 | 92.010 | 0.1616 |
| 1000.0 | 3.8736 | 34.4478 | 27.367 | 79.22 | 1.440 | -0.1427 | 92.030 | 0.3691 |
| 1010.0 | 3.8464 | 34.4518 | 27.373 | 78.68 | 1.448 | -0.1423 | 92.020 | 0.3923 |

**STATION:** 11 **DATE:** May 4, 1999 0908 UT
**LATITUDE:** 33° 25.10 N. **LONGITUDE:** 125° 33.84 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 14.1188 | 33.2243 | 24.790 | 314.77 | 0.006 | 0.5300 | 90.530 | 8.5046 |
| 5.0 | 14.1231 | 33.2257 | 24.791 | 314.84 | 0.016 | 0.5320 | 90.570 | 8.3969 |
| 10.0 | 14.1233 | 33.2255 | 24.791 | 314.98 | 0.031 | 0.5317 | 90.570 | 8.4477 |
| 15.0 | 14.1236 | 33.2261 | 24.791 | 315.08 | 0.047 | 0.5321 | 90.560 | 8.5219 |
| 20.0 | 14.1238 | 33.2261 | 24.791 | 315.20 | 0.063 | 0.5320 | 90.570 | 8.5155 |
| 25.0 | 14.1203 | 33.2265 | 24.793 | 315.23 | 0.079 | 0.5314 | 90.535 | 8.4720 |
| 30.0 | 14.1143 | 33.2290 | 24.796 | 315.06 | 0.095 | 0.5319 | 90.550 | 8.4385 |
| 40.0 | 14.0881 | 33.2355 | 24.807 | 314.32 | 0.126 | 0.5312 | 90.520 | 8.3501 |
| 50.0 | 14.0351 | 33.2375 | 24.819 | 313.37 | 0.157 | 0.5211 | 90.410 | 8.3292 |
| 60.0 | 14.0251 | 33.2366 | 24.821 | 313.50 | 0.189 | 0.5180 | 90.440 | 8.3131 |
| 70.0 | 13.9539 | 33.2407 | 24.839 | 312.04 | 0.220 | 0.5057 | 90.430 | 8.2995 |
| 80.0 | 13.9664 | 33.2491 | 24.844 | 311.92 | 0.251 | 0.5148 | 90.520 | 8.2734 |
| 100.0 | 13.4914 | 33.2188 | 24.918 | 305.34 | 0.313 | 0.3902 | 90.280 | 8.2879 |
| 150.0 | 10.4687 | 33.6200 | 25.797 | 222.30 | 0.445 | 0.1259 | 91.870 | 6.1590 |
| 200.0 | 9.0420 | 33.8901 | 26.246 | 180.35 | 0.542 | 0.0989 | 91.980 | 5.1558 |
| 250.0 | 8.4058 | 34.0135 | 26.442 | 162.43 | 0.627 | 0.0960 | 91.910 | 4.7330 |
| 300.0 | 7.5756 | 34.0225 | 26.572 | 150.50 | 0.705 | -0.0209 | 91.910 | 4.1899 |
| 350.0 | 6.9047 | 34.0367 | 26.677 | 140.88 | 0.778 | -0.1041 | 91.900 | 3.3140 |
| 400.0 | 6.2441 | 34.0284 | 26.758 | 133.40 | 0.847 | -0.1985 | 91.940 | 2.8495 |
| 450.0 | 5.8272 | 34.0569 | 26.834 | 126.55 | 0.912 | -0.2289 | 91.970 | 2.2153 |
| 500.0 | 5.4214 | 34.0727 | 26.896 | 120.89 | 0.974 | -0.2659 | 91.990 | 1.7143 |
| 550.0 | 5.0970 | 34.1099 | 26.963 | 114.70 | 1.033 | -0.2747 | 92.000 | 1.2961 |
| 600.0 | 5.1751 | 34.2221 | 27.044 | 107.85 | 1.088 | -0.1776 | 91.940 | 0.5187 |
| 650.0 | 4.9720 | 34.2796 | 27.113 | 101.63 | 1.141 | -0.1558 | 91.930 | 0.2699 |
| 700.0 | 4.7380 | 34.3261 | 27.177 | 95.84 | 1.190 | -0.1457 | 91.940 | 0.1854 |
| 750.0 | 4.5884 | 34.3529 | 27.215 | 92.54 | 1.237 | -0.1413 | 91.940 | 0.1630 |
| 800.0 | 4.4029 | 34.3848 | 27.261 | 88.43 | 1.282 | -0.1365 | 91.920 | 0.1905 |
| 1000.0 | 3.7876 | 34.4550 | 27.382 | 77.67 | 1.446 | -0.1455 | 91.980 | 0.4460 |
| 1008.0 | 3.7668 | 34.4576 | 27.386 | 77.30 | 1.453 | -0.1456 | 91.990 | 0.4654 |

**STATION:** 12 **DATE:** May 4, 1999 1117 UT
**LATITUDE:** 33° 33.16 N. **LONGITUDE:** 125° 25.42 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 13.0520 | 33.0305 | 24.857 | 308.42 | 0.006 | 0.1525 | 90.350 | 8.7721 |
| 5.0 | 13.0972 | 33.0405 | 24.856 | 308.60 | 0.015 | 0.1697 | 90.345 | 8.6925 |
| 10.0 | 13.0894 | 33.0385 | 24.856 | 308.72 | 0.031 | 0.1663 | 90.330 | 8.6943 |
| 15.0 | 13.1954 | 33.0654 | 24.856 | 308.87 | 0.046 | 0.2094 | 90.345 | 8.6578 |
| 20.0 | 13.3850 | 33.1139 | 24.856 | 309.04 | 0.062 | 0.2870 | 90.390 | 8.5949 |
| 25.0 | 13.6296 | 33.1837 | 24.860 | 308.75 | 0.077 | 0.3933 | 90.390 | 8.5149 |
| 30.0 | 13.5521 | 33.1724 | 24.868 | 308.20 | 0.093 | 0.3680 | 90.280 | 8.5114 |
| 40.0 | 12.6207 | 32.9579 | 24.886 | 306.62 | 0.123 | 0.0064 | 90.140 | 8.7675 |
| 50.0 | 12.3397 | 32.9030 | 24.898 | 305.74 | 0.154 | -0.0936 | 90.440 | 8.8476 |
| 60.0 | 12.0502 | 32.8725 | 24.929 | 302.98 | 0.184 | -0.1750 | 89.900 | 8.8731 |
| 70.0 | 12.1115 | 32.9548 | 24.982 | 298.24 | 0.214 | -0.0974 | 90.120 | 8.8552 |
| 80.0 | 11.9690 | 32.9967 | 25.041 | 292.81 | 0.244 | -0.0918 | 90.120 | 8.8764 |
| 100.0 | 11.3679 | 33.1817 | 25.296 | 268.97 | 0.301 | -0.0587 | 91.380 | 7.8812 |
| 150.0 | 9.8118 | 33.7745 | 26.029 | 200.10 | 0.415 | 0.1350 | 91.860 | 5.5809 |
| 200.0 | 8.7362 | 33.9616 | 26.350 | 170.37 | 0.507 | 0.1070 | 91.860 | 5.1945 |
| 250.0 | 7.9775 | 34.0147 | 26.507 | 156.04 | 0.589 | 0.0324 | 91.840 | 4.4583 |
| 300.0 | 7.2480 | 34.0327 | 26.626 | 145.15 | 0.664 | -0.0592 | 91.840 | 3.7275 |
| 350.0 | 6.5382 | 34.0257 | 26.718 | 136.79 | 0.734 | -0.1618 | 91.840 | 3.0791 |
| 400.0 | 5.9616 | 34.0438 | 26.806 | 128.62 | 0.800 | -0.2220 | 91.870 | 2.3249 |
| 450.0 | 5.5982 | 34.0991 | 26.895 | 120.54 | 0.863 | -0.2234 | 91.870 | 1.4467 |
| 500.0 | 5.4006 | 34.1758 | 26.980 | 112.96 | 0.921 | -0.1868 | 91.870 | 0.8362 |
| 550.0 | 5.1733 | 34.2127 | 27.036 | 107.98 | 0.976 | -0.1847 | 91.870 | 0.5135 |
| 600.0 | 4.9819 | 34.2617 | 27.097 | 102.55 | 1.029 | -0.1684 | 91.870 | 0.3094 |
| 650.0 | 4.8204 | 34.3008 | 27.147 | 98.21 | 1.079 | -0.1561 | 91.870 | 0.2141 |
| 700.0 | 4.7045 | 34.3400 | 27.192 | 94.40 | 1.127 | -0.1384 | 91.850 | 0.1737 |
| 750.0 | 4.4194 | 34.3546 | 27.235 | 90.39 | 1.173 | -0.1580 | 91.900 | 0.1489 |
| 800.0 | 4.2267 | 34.3774 | 27.274 | 86.88 | 1.218 | -0.1607 | 91.940 | 0.1662 |
| 1000.0 | 3.7302 | 34.4587 | 27.390 | 76.72 | 1.381 | -0.1482 | 91.940 | 0.4412 |
| 1010.0 | 3.7022 | 34.4623 | 27.396 | 76.21 | 1.389 | -0.1482 | 91.940 | 0.4708 |

**STATION:** 13 **DATE:** May 4, 1999 1316 UT
**LATITUDE:** 33° 41.09' N. **LONGITUDE:** 125° 17.00 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 12.0716 | 32.8430 | 24.901 | 304.26 | 0.006 | -0.1930 | 90.670 | 8.8957 |
| 5.0 | 12.0764 | 32.8433 | 24.900 | 304.39 | 0.015 | -0.1919 | 90.700 | 8.7850 |
| 10.0 | 12.0785 | 32.8433 | 24.900 | 304.54 | 0.030 | -0.1916 | 90.720 | 8.8128 |
| 15.0 | 12.0673 | 32.8433 | 24.902 | 304.45 | 0.046 | -0.1939 | 90.660 | 8.8538 |
| 20.0 | 12.0526 | 32.8429 | 24.905 | 304.33 | 0.061 | -0.1972 | 90.670 | 8.9207 |
| 25.0 | 11.9385 | 32.8507 | 24.932 | 301.82 | 0.076 | -0.2132 | 90.760 | 9.0022 |
| 30.0 | 11.9139 | 32.8549 | 24.940 | 301.19 | 0.091 | -0.2147 | 90.770 | 9.0434 |
| 40.0 | 11.8684 | 32.8828 | 24.971 | 298.54 | 0.121 | -0.2014 | 90.690 | 9.1247 |
| 50.0 | 11.8158 | 32.9036 | 24.997 | 296.29 | 0.151 | -0.1951 | 90.760 | 8.9965 |
| 60.0 | 11.9239 | 32.9480 | 25.011 | 295.15 | 0.180 | -0.1390 | 90.360 | 8.7621 |
| 70.0 | 12.0326 | 32.9859 | 25.021 | 294.52 | 0.210 | -0.0879 | 90.100 | 8.6328 |
| 80.0 | 12.1660 | 33.1233 | 25.102 | 287.02 | 0.239 | 0.0475 | 89.720 | 8.6051 |
| 100.0 | 11.1416 | 33.0584 | 25.241 | 274.16 | 0.295 | -0.1992 | 91.160 | 7.9293 |
| 150.0 | 9.5247 | 33.7413 | 26.051 | 197.98 | 0.412 | 0.0606 | 91.550 | 5.1222 |
| 200.0 | 8.6357 | 33.9790 | 26.379 | 167.56 | 0.502 | 0.1050 | 91.620 | 5.1426 |
| 250.0 | 7.9508 | 34.0251 | 26.519 | 154.88 | 0.583 | 0.0367 | 91.730 | 4.3123 |
| 300.0 | 7.0571 | 34.0135 | 26.638 | 143.96 | 0.657 | -0.1010 | 91.760 | 3.7406 |
| 350.0 | 6.5081 | 34.0408 | 26.733 | 135.27 | 0.727 | -0.1538 | 91.760 | 2.9096 |
| 400.0 | 6.1251 | 34.0798 | 26.814 | 128.03 | 0.793 | -0.1730 | 91.760 | 1.8686 |
| 450.0 | 5.7213 | 34.1166 | 26.894 | 120.78 | 0.855 | -0.1946 | 91.770 | 1.3198 |
| 500.0 | 5.3720 | 34.1643 | 26.974 | 113.46 | 0.914 | -0.1993 | 91.800 | 0.8173 |
| 550.0 | 5.1826 | 34.2238 | 27.044 | 107.27 | 0.969 | -0.1749 | 91.800 | 0.4640 |
| 600.0 | 4.9372 | 34.2588 | 27.100 | 102.22 | 1.021 | -0.1757 | 91.810 | 0.3154 |
| 650.0 | 4.7510 | 34.2967 | 27.152 | 97.68 | 1.071 | -0.1670 | 91.820 | 0.1957 |
| 700.0 | 4.5428 | 34.3258 | 27.198 | 93.52 | 1.119 | -0.1671 | 91.820 | 0.1503 |
| 750.0 | 4.3280 | 34.3638 | 27.252 | 88.63 | 1.164 | -0.1604 | 91.850 | 0.1400 |
| 800.0 | 4.1829 | 34.4012 | 27.297 | 84.60 | 1.208 | -0.1465 | 91.840 | 0.1856 |
| 1000.0 | 3.6957 | 34.4769 | 27.408 | 74.97 | 1.367 | -0.1373 | 91.820 | 0.5291 |
| 1200.0 | 3.2484 | 34.5213 | 27.488 | 67.95 | 1.509 | -0.1459 | 91.820 | 0.8760 |
| 1400.0 | 2.8475 | 34.5558 | 27.553 | 62.02 | 1.639 | -0.1557 | 91.820 | 1.2415 |
| 1600.0 | 2.6014 | 34.5755 | 27.591 | 58.82 | 1.760 | -0.1623 | 91.830 | 1.5032 |
| 1800.0 | 2.2956 | 34.5999 | 27.637 | 54.39 | 1.873 | -0.1691 | 91.850 | 1.9159 |
| 2000.0 | 2.0970 | 34.6203 | 27.671 | 51.39 | 1.979 | -0.1697 | 91.850 | 2.3002 |
| 2200.0 | 1.9361 | 34.6305 | 27.692 | 49.46 | 2.079 | -0.1750 | 91.870 | 2.5272 |
| 2400.0 | 1.8154 | 34.6408 | 27.711 | 47.93 | 2.176 | -0.1770 | 91.870 | 2.7824 |
| 2600.0 | 1.7272 | 34.6501 | 27.726 | 46.80 | 2.271 | -0.1772 | 91.870 | 3.0484 |
| 2800.0 | 1.6565 | 34.6576 | 27.739 | 45.96 | 2.364 | -0.1776 | 91.870 | 3.2783 |
| 3000.0 | 1.5999 | 34.6629 | 27.748 | 45.42 | 2.455 | -0.1786 | 91.870 | 3.4428 |
| 3200.0 | 1.5530 | 34.6682 | 27.757 | 44.97 | 2.545 | -0.1790 | 91.870 | 3.6272 |
| 3400.0 | 1.5139 | 34.6736 | 27.766 | 44.58 | 2.635 | -0.1787 | 91.870 | 3.8575 |
| 3600.0 | 1.4959 | 34.6775 | 27.771 | 44.58 | 2.724 | -0.1782 | 91.870 | 4.0666 |
| 3800.0 | 1.4841 | 34.6809 | 27.776 | 44.69 | 2.813 | -0.1778 | 91.870 | 4.2636 |
| 4000.0 | 1.4852 | 34.6834 | 27.780 | 45.05 | 2.903 | -0.1772 | 91.870 | 4.4180 |
| 4200.0 | 1.4985 | 34.6846 | 27.781 | 45.70 | 2.994 | -0.1768 | 91.850 | 4.4849 |
| 4400.0 | 1.5153 | 34.6854 | 27.782 | 46.44 | 3.086 | -0.1766 | 91.800 | 4.5438 |
| 4600.0 | 1.5371 | 34.6855 | 27.783 | 47.31 | 3.180 | -0.1767 | 91.780 | 4.5705 |
| 4632.0 | 1.5409 | 34.6857 | 27.783 | 47.45 | 3.195 | -0.1765 | 91.780 | 4.5709 |

**STATION:** 14 **DATE:** May 4, 1999 1739 UT
**LATITUDE:** 33° 49.08 N. **LONGITUDE:** 125° 08.61 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 11.6292 | 32.8435 | 24.983 | 296.41 | 0.006 | -0.2777 | 90.650 | 8.2959 |
| 5.0 | 11.6312 | 32.8450 | 24.984 | 296.39 | 0.015 | -0.2762 | 90.640 | 8.2527 |
| 10.0 | 11.6323 | 32.8469 | 24.986 | 296.38 | 0.030 | -0.2746 | 90.660 | 8.2003 |
| 15.0 | 11.6351 | 32.8499 | 24.987 | 296.32 | 0.044 | -0.2718 | 90.585 | 8.1978 |
| 20.0 | 11.6503 | 32.8634 | 24.995 | 295.69 | 0.059 | -0.2582 | 90.510 | 8.2038 |
| 25.0 | 11.7163 | 32.9066 | 25.017 | 293.77 | 0.074 | -0.2111 | 90.325 | 8.2073 |
| 30.0 | 11.7718 | 32.9443 | 25.036 | 292.07 | 0.089 | -0.1705 | 90.130 | 8.2211 |
| 40.0 | 11.7608 | 32.9595 | 25.050 | 290.97 | 0.118 | -0.1606 | 90.130 | 8.2208 |
| 50.0 | 11.8329 | 33.0140 | 25.079 | 288.44 | 0.147 | -0.1035 | 90.120 | 8.1730 |
| 60.0 | 11.8952 | 33.0327 | 25.082 | 288.39 | 0.176 | -0.0768 | 90.180 | 8.1640 |
| 70.0 | 11.9383 | 33.0522 | 25.090 | 287.94 | 0.204 | -0.0532 | 90.400 | 8.1416 |
| 80.0 | 11.7591 | 33.0665 | 25.134 | 283.91 | 0.233 | -0.0764 | 90.460 | 8.1385 |
| 100.0 | 10.7663 | 33.2370 | 25.446 | 254.58 | 0.288 | -0.1249 | 91.130 | 7.1557 |
| 150.0 | 9.2092 | 33.7613 | 26.117 | 191.56 | 0.394 | 0.0247 | 91.370 | 4.4654 |
| 200.0 | 8.6149 | 33.9683 | 26.374 | 168.04 | 0.484 | 0.0933 | 91.480 | 4.8328 |
| 250.0 | 7.7889 | 34.0133 | 26.534 | 153.43 | 0.564 | 0.0035 | 91.540 | 4.5065 |
| 300.0 | 7.5203 | 34.0572 | 26.607 | 147.14 | 0.639 | -0.0013 | 91.570 | 2.9660 |
| 350.0 | 6.8467 | 34.0723 | 26.713 | 137.45 | 0.710 | -0.0838 | 91.600 | 2.4138 |
| 400.0 | 6.5191 | 34.1287 | 26.802 | 129.56 | 0.777 | -0.0835 | 91.600 | 1.6886 |
| 450.0 | 6.0684 | 34.1531 | 26.880 | 122.49 | 0.840 | -0.1228 | 91.600 | 1.2467 |
| 500.0 | 5.3758 | 34.1367 | 26.952 | 115.56 | 0.899 | -0.2207 | 91.650 | 0.9376 |
| 550.0 | 4.9868 | 34.1646 | 27.019 | 109.30 | 0.955 | -0.2440 | 91.720 | 0.7046 |
| 600.0 | 4.7681 | 34.2173 | 27.086 | 103.28 | 1.008 | -0.2272 | 91.730 | 0.4043 |
| 650.0 | 4.7269 | 34.2721 | 27.135 | 99.21 | 1.059 | -0.1890 | 91.720 | 0.2299 |
| 700.0 | 4.5652 | 34.3080 | 27.181 | 95.11 | 1.108 | -0.1787 | 91.710 | 0.1605 |
| 750.0 | 4.4156 | 34.3442 | 27.227 | 91.12 | 1.154 | -0.1666 | 91.740 | 0.1301 |
| 800.0 | 4.3324 | 34.3740 | 27.260 | 88.39 | 1.199 | -0.1524 | 91.730 | 0.1423 |
| 1000.0 | 3.7131 | 34.4646 | 27.397 | 76.08 | 1.362 | -0.1452 | 91.730 | 0.4110 |
| 1012.0 | 3.6689 | 34.4703 | 27.406 | 75.24 | 1.371 | -0.1451 | 91.740 | 0.4406 |

**STATION:** 15 **DATE:** May 4, 1999 1944 UT
**LATITUDE:** 33° 56.93 N. **LONGITUDE:** 125° 00.20 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 12.4803 | 33.1068 | 25.028 | 292.18 | 0.006 | 0.0981 | 89.210 | 8.4890 |
| 5.0 | 12.4589 | 33.1057 | 25.031 | 291.94 | 0.015 | 0.0930 | 89.190 | 7.6437 |
| 10.0 | 12.4526 | 33.1058 | 25.033 | 291.93 | 0.029 | 0.0917 | 89.200 | 7.5245 |
| 15.0 | 12.4391 | 33.1047 | 25.034 | 291.88 | 0.044 | 0.0879 | 89.175 | 7.3828 |
| 20.0 | 12.4154 | 33.1025 | 25.037 | 291.72 | 0.058 | 0.0814 | 88.980 | 7.2105 |
| 25.0 | 12.0490 | 33.0765 | 25.087 | 287.13 | 0.073 | -0.0113 | 88.960 | 7.1412 |
| 30.0 | 11.9909 | 33.0741 | 25.096 | 286.37 | 0.087 | -0.0246 | 88.940 | 7.0268 |
| 40.0 | 11.9530 | 33.1103 | 25.131 | 283.25 | 0.116 | -0.0032 | 89.090 | 6.7009 |
| 50.0 | 11.8953 | 33.1392 | 25.165 | 280.31 | 0.144 | 0.0085 | 89.600 | 6.4600 |
| 60.0 | 11.9688 | 33.1801 | 25.183 | 278.83 | 0.172 | 0.0550 | 90.150 | 6.3230 |
| 70.0 | 12.0240 | 33.2153 | 25.200 | 277.44 | 0.200 | 0.0934 | 90.360 | 6.2706 |
| 80.0 | 11.6672 | 33.2190 | 25.270 | 271.03 | 0.227 | 0.0278 | 90.560 | 6.2816 |
| 100.0 | 10.0900 | 33.3196 | 25.627 | 237.29 | 0.277 | -0.1783 | 91.270 | 5.5549 |
| 150.0 | 9.2056 | 33.8491 | 26.187 | 184.99 | 0.378 | 0.0937 | 91.470 | 3.3236 |
| 200.0 | 8.4040 | 34.0176 | 26.445 | 161.23 | 0.465 | 0.0998 | 91.470 | 2.8944 |
| 250.0 | 7.5830 | 34.0512 | 26.593 | 147.69 | 0.542 | 0.0036 | 91.520 | 2.5605 |
| 300.0 | 7.0181 | 34.0829 | 26.698 | 138.27 | 0.613 | -0.0514 | 91.590 | 1.9090 |
| 350.0 | 6.2328 | 34.0499 | 26.776 | 131.00 | 0.681 | -0.1824 | 91.540 | 1.6350 |
| 400.0 | 5.8198 | 34.0648 | 26.840 | 125.26 | 0.745 | -0.2230 | 91.560 | 1.4144 |
| 450.0 | 5.8304 | 34.1455 | 26.903 | 120.01 | 0.806 | -0.1584 | 91.560 | 1.0036 |
| 500.0 | 5.5936 | 34.1751 | 26.956 | 115.42 | 0.865 | -0.1644 | 91.540 | 0.5801 |
| 550.0 | 5.1914 | 34.1910 | 27.017 | 109.82 | 0.922 | -0.1998 | 91.580 | 0.4439 |
| 600.0 | 4.7569 | 34.2030 | 27.076 | 104.21 | 0.975 | -0.2398 | 91.670 | 0.3399 |
| 650.0 | 4.5638 | 34.2378 | 27.125 | 99.82 | 1.026 | -0.2338 | 91.680 | 0.2073 |
| 700.0 | 4.4064 | 34.2791 | 27.176 | 95.38 | 1.075 | -0.2185 | 91.680 | 0.1269 |
| 750.0 | 4.2772 | 34.3150 | 27.218 | 91.65 | 1.122 | -0.2042 | 91.680 | 0.0662 |
| 800.0 | 4.1823 | 34.3536 | 27.259 | 88.13 | 1.167 | -0.1840 | 91.680 | 0.0354 |
| 1000.0 | 3.7923 | 34.4564 | 27.382 | 77.62 | 1.332 | -0.1440 | 91.660 | 0.1821 |
| 1010.0 | 3.7789 | 34.4581 | 27.385 | 77.42 | 1.340 | -0.1440 | 91.650 | 0.1964 |

**STATION:** 16 **DATE:** May 4, 1999 2153 UT
**LATITUDE:** 34° 04.89 N. **LONGITUDE:** 124° 51.75 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 12.8736 | 33.0730 | 24.925 | 301.94 | 0.006 | 0.1501 | 88.630 | 9.1138 |
| 5.0 | 12.8734 | 33.0732 | 24.925 | 302.00 | 0.015 | 0.1501 | 88.650 | 9.1129 |
| 10.0 | 12.8711 | 33.0734 | 24.926 | 302.05 | 0.030 | 0.1497 | 88.650 | 9.1488 |
| 15.0 | 12.8182 | 33.0739 | 24.937 | 301.15 | 0.045 | 0.1392 | 88.630 | 9.1574 |
| 20.0 | 12.7481 | 33.0788 | 24.955 | 299.60 | 0.060 | 0.1289 | 88.430 | 9.1479 |
| 25.0 | 12.6331 | 33.1563 | 25.037 | 291.88 | 0.075 | 0.1674 | 88.165 | 9.1292 |
| 30.0 | 12.4913 | 33.1522 | 25.062 | 289.68 | 0.090 | 0.1358 | 88.490 | 9.1104 |
| 40.0 | 12.2736 | 33.1499 | 25.102 | 286.10 | 0.118 | 0.0907 | 89.720 | 8.8061 |
| 50.0 | 12.3488 | 33.2099 | 25.134 | 283.28 | 0.147 | 0.1530 | 89.950 | 8.7368 |
| 60.0 | 11.9969 | 33.1831 | 25.180 | 279.11 | 0.175 | 0.0628 | 90.440 | 8.6288 |
| 70.0 | 11.6263 | 33.2403 | 25.294 | 268.52 | 0.202 | 0.0373 | 90.730 | 8.3184 |
| 80.0 | 10.9655 | 33.2795 | 25.444 | 254.39 | 0.228 | -0.0545 | 91.010 | 7.8819 |
| 100.0 | 10.6505 | 33.5753 | 25.730 | 227.62 | 0.277 | 0.1237 | 91.300 | 6.1061 |
| 150.0 | 9.1318 | 33.8853 | 26.227 | 181.17 | 0.377 | 0.1104 | 91.500 | 3.8744 |
| 200.0 | 8.4532 | 34.0136 | 26.434 | 162.26 | 0.463 | 0.1042 | 91.470 | 3.5386 |
| 250.0 | 7.7364 | 34.0642 | 26.581 | 148.90 | 0.540 | 0.0361 | 91.500 | 3.0136 |
| 300.0 | 7.1351 | 34.0537 | 26.659 | 142.04 | 0.613 | -0.0584 | 91.600 | 2.8863 |
| 350.0 | 6.7752 | 34.0858 | 26.733 | 135.48 | 0.683 | -0.0828 | 91.560 | 2.2274 |
| 400.0 | 6.2636 | 34.1010 | 26.813 | 128.25 | 0.748 | -0.1386 | 91.540 | 1.7563 |
| 450.0 | 6.0070 | 34.1701 | 26.901 | 120.44 | 0.810 | -0.1171 | 91.510 | 1.0983 |
| 500.0 | 5.2984 | 34.1933 | 27.006 | 110.40 | 0.868 | -0.1850 | 91.470 | 0.6251 |
| 550.0 | 5.1496 | 34.2135 | 27.040 | 107.63 | 0.922 | -0.1868 | 91.500 | 0.5042 |
| 600.0 | 4.7696 | 34.2336 | 27.099 | 102.08 | 0.975 | -0.2142 | 91.580 | 0.3444 |
| 650.0 | 4.5210 | 34.2607 | 27.148 | 97.62 | 1.025 | -0.2203 | 91.600 | 0.2336 |
| 700.0 | 4.5345 | 34.3222 | 27.196 | 93.69 | 1.072 | -0.1708 | 91.590 | 0.1596 |
| 750.0 | 4.4032 | 34.3572 | 27.238 | 90.01 | 1.118 | -0.1577 | 91.580 | 0.1499 |
| 800.0 | 4.2612 | 34.3813 | 27.273 | 87.00 | 1.163 | -0.1541 | 91.590 | 0.1670 |
| 1000.0 | 3.7118 | 34.4654 | 27.398 | 76.01 | 1.326 | -0.1447 | 91.610 | 0.4531 |
| 1012.0 | 3.6809 | 34.4683 | 27.403 | 75.53 | 1.335 | -0.1455 | 91.600 | 0.4869 |

**STATION:** 17 **DATE:** May 4, 1999 2351 UT
**LATITUDE:** 34° 12.77 N. **LONGITUDE:** 124° 43.18 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 12.6267 | 33.1943 | 25.067 | 288.41 | 0.006 | 0.1970 | 87.990 | 9.0411 |
| 5.0 | 12.6227 | 33.1942 | 25.068 | 288.42 | 0.014 | 0.1960 | 88.335 | 9.0273 |
| 10.0 | 12.6141 | 33.1943 | 25.070 | 288.37 | 0.029 | 0.1943 | 88.300 | 9.1039 |
| 15.0 | 12.4668 | 33.2037 | 25.106 | 285.08 | 0.043 | 0.1723 | 88.350 | 9.2046 |
| 20.0 | 12.4314 | 33.2511 | 25.150 | 281.05 | 0.057 | 0.2029 | 88.120 | 9.3782 |
| 25.0 | 12.3791 | 33.2659 | 25.171 | 279.12 | 0.071 | 0.2042 | 88.570 | 9.4527 |
| 30.0 | 12.3298 | 33.2735 | 25.187 | 277.78 | 0.085 | 0.2004 | 89.010 | 9.6041 |
| 40.0 | 12.2884 | 33.2772 | 25.198 | 276.98 | 0.113 | 0.1950 | 88.960 | 9.5047 |
| 50.0 | 12.1026 | 33.2584 | 25.219 | 275.23 | 0.141 | 0.1435 | 90.050 | 9.2222 |
| 60.0 | 11.9001 | 33.2762 | 25.271 | 270.50 | 0.168 | 0.1183 | 90.390 | 8.7716 |
| 70.0 | 10.9729 | 33.3719 | 25.514 | 247.48 | 0.194 | 0.0207 | 90.560 | 8.1744 |
| 80.0 | 10.5404 | 33.5669 | 25.742 | 225.98 | 0.218 | 0.0978 | 91.130 | 6.3774 |
| 100.0 | 9.7848 | 33.7182 | 25.989 | 202.86 | 0.260 | 0.0868 | 91.310 | 5.0194 |
| 150.0 | 8.9565 | 33.9549 | 26.309 | 173.32 | 0.355 | 0.1374 | 91.370 | 3.5346 |
| 200.0 | 8.2478 | 34.0309 | 26.479 | 157.94 | 0.437 | 0.0865 | 91.440 | 3.3358 |
| 250.0 | 7.6283 | 34.0491 | 26.585 | 148.49 | 0.513 | 0.0085 | 91.470 | 3.0931 |
| 300.0 | 6.9865 | 34.0594 | 26.683 | 139.58 | 0.585 | -0.0743 | 91.540 | 2.6614 |
| 350.0 | 6.4393 | 34.0643 | 26.761 | 132.61 | 0.654 | -0.1443 | 91.480 | 2.2897 |
| 400.0 | 6.0690 | 34.0884 | 26.828 | 126.67 | 0.718 | -0.1733 | 91.490 | 1.6690 |
| 450.0 | 5.6924 | 34.1214 | 26.901 | 120.06 | 0.780 | -0.1944 | 91.480 | 1.1904 |
| 500.0 | 5.4291 | 34.1548 | 26.960 | 114.88 | 0.839 | -0.2001 | 91.480 | 0.8625 |
| 550.0 | 4.9525 | 34.1859 | 27.040 | 107.30 | 0.894 | -0.2310 | 91.560 | 0.6187 |
| 600.0 | 4.7389 | 34.2222 | 27.093 | 102.57 | 0.947 | -0.2266 | 91.560 | 0.3728 |
| 650.0 | 4.7031 | 34.2781 | 27.142 | 98.48 | 0.997 | -0.1869 | 91.530 | 0.2169 |
| 700.0 | 4.5748 | 34.3129 | 27.184 | 94.86 | 1.045 | -0.1738 | 91.540 | 0.1599 |
| 750.0 | 4.5109 | 34.3495 | 27.221 | 91.86 | 1.092 | -0.1523 | 91.530 | 0.1409 |
| 800.0 | 4.3760 | 34.3792 | 27.259 | 88.52 | 1.137 | -0.1437 | 91.530 | 0.1656 |
| 1000.0 | 3.7465 | 34.4593 | 27.389 | 76.87 | 1.302 | -0.1462 | 91.560 | 0.4063 |
| 1200.0 | 3.2700 | 34.5068 | 27.474 | 69.27 | 1.448 | -0.1553 | 91.550 | 0.7343 |
| 1400.0 | 2.8727 | 34.5456 | 27.543 | 63.07 | 1.580 | -0.1615 | 91.590 | 1.1364 |
| 1600.0 | 2.5313 | 34.5735 | 27.596 | 58.13 | 1.701 | -0.1696 | 91.610 | 1.4917 |
| 1800.0 | 2.2163 | 34.5983 | 27.642 | 53.56 | 1.812 | -0.1766 | 91.610 | 1.8662 |
| 2000.0 | 2.0146 | 34.6179 | 27.675 | 50.55 | 1.916 | -0.1778 | 91.620 | 2.2438 |
| 2200.0 | 1.8729 | 34.6331 | 27.699 | 48.48 | 2.015 | -0.1776 | 91.610 | 2.5849 |
| 2400.0 | 1.7751 | 34.6429 | 27.716 | 47.26 | 2.111 | -0.1782 | 91.600 | 2.8154 |
| 2600.0 | 1.6999 | 34.6530 | 27.731 | 46.23 | 2.204 | -0.1769 | 91.590 | 3.1124 |
| 2800.0 | 1.6375 | 34.6591 | 27.741 | 45.59 | 2.296 | -0.1777 | 91.590 | 3.3228 |
| 3000.0 | 1.5976 | 34.6646 | 27.750 | 45.26 | 2.387 | -0.1775 | 91.580 | 3.5106 |
| 3200.0 | 1.5593 | 34.6698 | 27.758 | 44.94 | 2.477 | -0.1773 | 91.570 | 3.7019 |
| 3400.0 | 1.5221 | 34.6735 | 27.765 | 44.70 | 2.567 | -0.1783 | 91.570 | 3.8575 |
| 3600.0 | 1.4973 | 34.6777 | 27.771 | 44.58 | 2.656 | -0.1780 | 91.570 | 4.0483 |
| 3800.0 | 1.4843 | 34.6812 | 27.776 | 44.67 | 2.745 | -0.1775 | 91.570 | 4.2449 |
| 4000.0 | 1.4880 | 34.6834 | 27.779 | 45.10 | 2.835 | -0.1770 | 91.560 | 4.3785 |
| 4200.0 | 1.4997 | 34.6845 | 27.781 | 45.73 | 2.926 | -0.1768 | 91.530 | 4.4651 |
| 4400.0 | 1.5166 | 34.6855 | 27.782 | 46.45 | 3.018 | -0.1765 | 91.510 | 4.5227 |
| 4496.0 | 1.5266 | 34.6858 | 27.783 | 46.84 | 3.063 | -0.1763 | 91.480 | 4.5385 |

**STATION:** 18 **DATE:** May 5, 1999 0414 UT
**LATITUDE:** 34° 20.47 N. **LONGITUDE:** 124° 34.79 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 12.6615 | 33.1334 | 25.013 | 293.55 | 0.006 | 0.1555 | 88.550 | 8.9089 |
| 5.0 | 12.6500 | 33.1331 | 25.015 | 293.43 | 0.015 | 0.1529 | 88.555 | 8.7676 |
| 10.0 | 12.6504 | 33.1343 | 25.016 | 293.46 | 0.029 | 0.1538 | 88.630 | 8.7478 |
| 15.0 | 12.6548 | 33.1604 | 25.036 | 291.73 | 0.044 | 0.1753 | 88.595 | 8.7450 |
| 20.0 | 12.6606 | 33.2601 | 25.112 | 284.61 | 0.058 | 0.2556 | 88.830 | 8.7496 |
| 25.0 | 12.6302 | 33.2771 | 25.131 | 282.92 | 0.073 | 0.2629 | 88.440 | 8.7620 |
| 30.0 | 12.4633 | 33.2954 | 25.178 | 278.61 | 0.087 | 0.2441 | 88.260 | 8.7856 |
| 40.0 | 12.2455 | 33.2952 | 25.220 | 274.87 | 0.114 | 0.2009 | 88.430 | 8.7205 |
| 50.0 | 12.2296 | 33.3090 | 25.234 | 273.80 | 0.142 | 0.2085 | 88.640 | 8.6003 |
| 60.0 | 12.2042 | 33.3169 | 25.245 | 272.98 | 0.169 | 0.2095 | 89.660 | 8.5564 |
| 70.0 | 12.1571 | 33.3159 | 25.253 | 272.43 | 0.196 | 0.1993 | 89.940 | 8.4926 |
| 80.0 | 11.1413 | 33.3652 | 25.479 | 251.07 | 0.223 | 0.0460 | 89.920 | 7.9599 |
| 100.0 | 10.2165 | 33.5103 | 25.754 | 225.23 | 0.270 | -0.0044 | 91.020 | 5.8599 |
| 150.0 | 9.1351 | 33.9331 | 26.264 | 177.68 | 0.368 | 0.1488 | 91.170 | 3.5817 |
| 200.0 | 8.1843 | 34.0317 | 26.489 | 156.95 | 0.452 | 0.0775 | 91.240 | 3.4002 |
| 250.0 | 7.5080 | 34.0729 | 26.621 | 145.02 | 0.527 | 0.0100 | 91.330 | 2.8384 |
| 300.0 | 6.8590 | 34.0815 | 26.718 | 136.22 | 0.597 | -0.0742 | 91.360 | 2.3790 |
| 350.0 | 6.1856 | 34.0695 | 26.798 | 128.93 | 0.663 | -0.1729 | 91.340 | 2.1074 |
| 400.0 | 5.6263 | 34.0813 | 26.877 | 121.62 | 0.726 | -0.2336 | 91.320 | 1.5778 |
| 450.0 | 5.3507 | 34.1201 | 26.941 | 115.93 | 0.786 | -0.2362 | 91.330 | 1.1239 |
| 500.0 | 5.1896 | 34.1919 | 27.017 | 109.18 | 0.842 | -0.1988 | 91.340 | 0.6290 |
| 550.0 | 4.8835 | 34.2181 | 27.074 | 104.08 | 0.896 | -0.2133 | 91.360 | 0.4399 |
| 600.0 | 4.7274 | 34.2720 | 27.134 | 98.72 | 0.946 | -0.1886 | 91.370 | 0.2484 |
| 650.0 | 4.5967 | 34.3001 | 27.171 | 95.58 | 0.995 | -0.1811 | 91.350 | 0.1737 |
| 700.0 | 4.4733 | 34.3378 | 27.215 | 91.80 | 1.042 | -0.1651 | 91.370 | 0.1428 |
| 750.0 | 4.3279 | 34.3744 | 27.260 | 87.84 | 1.086 | -0.1521 | 91.370 | 0.1584 |
| 800.0 | 4.2465 | 34.4011 | 27.290 | 85.36 | 1.130 | -0.1400 | 91.360 | 0.2094 |
| 1000.0 | 3.6991 | 34.4647 | 27.398 | 75.91 | 1.291 | -0.1465 | 91.380 | 0.4667 |
| 1010.0 | 3.6642 | 34.4691 | 27.405 | 75.26 | 1.298 | -0.1465 | 91.390 | 0.5019 |

**STATION:** 19 **DATE:** May 5, 1999 0643 UT
**LATITUDE:** 34° 28.45 N. **LONGITUDE:** 124° 26.10 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 12.3994 | 33.0237 | 24.979 | 296.83 | 0.006 | 0.0158 | 88.000 | 9.1888 |
| 5.0 | 12.3995 | 33.0236 | 24.979 | 296.91 | 0.015 | 0.0157 | 87.990 | 9.0793 |
| 10.0 | 12.4018 | 33.0233 | 24.978 | 297.09 | 0.030 | 0.0158 | 87.990 | 9.0694 |
| 15.0 | 12.4079 | 33.0261 | 24.979 | 297.10 | 0.045 | 0.0191 | 87.905 | 9.0650 |
| 20.0 | 12.4146 | 33.0300 | 24.981 | 297.06 | 0.059 | 0.0234 | 87.940 | 9.0521 |
| 25.0 | 12.4296 | 33.0451 | 24.990 | 296.34 | 0.074 | 0.0383 | 87.950 | 9.0394 |
| 30.0 | 12.5052 | 33.1421 | 25.051 | 290.68 | 0.089 | 0.1305 | 87.800 | 9.0033 |
| 40.0 | 12.4403 | 33.1980 | 25.107 | 285.60 | 0.118 | 0.1619 | 88.820 | 8.7985 |
| 50.0 | 12.3869 | 33.2033 | 25.122 | 284.46 | 0.146 | 0.1553 | 89.340 | 8.7253 |
| 60.0 | 11.8735 | 33.2741 | 25.274 | 270.18 | 0.174 | 0.1115 | 90.170 | 8.3500 |
| 70.0 | 10.8360 | 33.4015 | 25.561 | 242.97 | 0.200 | 0.0194 | 90.780 | 7.3153 |
| 80.0 | 10.3437 | 33.6084 | 25.809 | 219.66 | 0.223 | 0.0961 | 91.040 | 5.6717 |
| 100.0 | 9.7730 | 33.7836 | 26.042 | 197.83 | 0.265 | 0.1366 | 91.150 | 4.2360 |
| 150.0 | 8.8800 | 33.9889 | 26.348 | 169.63 | 0.356 | 0.1521 | 91.100 | 3.1458 |
| 200.0 | 8.0139 | 34.0674 | 26.542 | 151.83 | 0.436 | 0.0802 | 91.130 | 2.8283 |
| 250.0 | 6.9428 | 34.0598 | 26.689 | 138.23 | 0.508 | -0.0793 | 91.220 | 2.7516 |
| 300.0 | 6.4059 | 34.0548 | 26.757 | 132.21 | 0.575 | -0.1555 | 91.220 | 2.4348 |
| 350.0 | 5.7942 | 34.0508 | 26.832 | 125.38 | 0.640 | -0.2367 | 91.240 | 2.0484 |
| 400.0 | 5.5605 | 34.0967 | 26.897 | 119.66 | 0.701 | -0.2293 | 91.240 | 1.4366 |
| 450.0 | 5.3756 | 34.1491 | 26.961 | 114.07 | 0.759 | -0.2104 | 91.020 | 0.9204 |
| 500.0 | 5.1870 | 34.2177 | 27.038 | 107.23 | 0.814 | -0.1787 | 91.250 | 0.4923 |
| 550.0 | 4.9503 | 34.2485 | 27.090 | 102.62 | 0.867 | -0.1819 | 91.260 | 0.3354 |
| 600.0 | 4.7453 | 34.2807 | 27.139 | 98.29 | 0.917 | -0.1797 | 91.270 | 0.2186 |
| 650.0 | 4.5553 | 34.3188 | 27.191 | 93.70 | 0.965 | -0.1708 | 91.270 | 0.1629 |
| 700.0 | 4.4092 | 34.3488 | 27.231 | 90.23 | 1.011 | -0.1633 | 91.290 | 0.1529 |
| 750.0 | 4.3074 | 34.3803 | 27.267 | 87.16 | 1.055 | -0.1496 | 91.270 | 0.1644 |
| 800.0 | 4.1612 | 34.4022 | 27.300 | 84.27 | 1.098 | -0.1479 | 91.260 | 0.2104 |
| 1000.0 | 3.6261 | 34.4742 | 27.413 | 74.36 | 1.256 | -0.1461 | 91.290 | 0.5275 |
| 1010.0 | 3.5950 | 34.4768 | 27.418 | 73.88 | 1.263 | -0.1471 | 91.310 | 0.5511 |

**STATION:** 20 **DATE:** May 5, 1999 0912 UT
**LATITUDE:** 34° 36.50 N. **LONGITUDE:** 124° 17.57 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 12.6027 | 32.9275 | 24.865 | 307.65 | 0.006 | -0.0205 | 88.670 | 8.8560 |
| 5.0 | 12.6047 | 32.9276 | 24.865 | 307.75 | 0.015 | -0.0202 | 88.725 | 8.8451 |
| 10.0 | 12.6086 | 32.9276 | 24.864 | 307.94 | 0.031 | -0.0195 | 88.770 | 8.8884 |
| 15.0 | 12.6087 | 32.9277 | 24.865 | 308.05 | 0.046 | -0.0196 | 88.785 | 8.9420 |
| 20.0 | 12.6085 | 32.9278 | 24.865 | 308.15 | 0.062 | -0.0196 | 88.790 | 9.0204 |
| 25.0 | 12.6090 | 32.9279 | 24.865 | 308.27 | 0.077 | -0.0195 | 88.765 | 9.0569 |
| 30.0 | 12.5485 | 32.9323 | 24.880 | 306.95 | 0.092 | -0.0283 | 88.750 | 9.0064 |
| 40.0 | 12.1345 | 33.0020 | 25.013 | 294.50 | 0.122 | -0.0545 | 88.830 | 9.0576 |
| 50.0 | 11.9338 | 33.1096 | 25.135 | 283.18 | 0.151 | -0.0077 | 89.810 | 8.6625 |
| 60.0 | 11.5645 | 33.3574 | 25.396 | 258.56 | 0.178 | 0.1190 | 90.220 | 8.3214 |
| 70.0 | 11.0116 | 33.4492 | 25.567 | 242.42 | 0.204 | 0.0893 | 90.710 | 6.9917 |
| 80.0 | 10.1052 | 33.4268 | 25.707 | 229.21 | 0.227 | -0.0898 | 90.900 | 5.9420 |
| 100.0 | 9.8711 | 33.6171 | 25.896 | 211.73 | 0.271 | 0.0211 | 90.980 | 5.2113 |
| 150.0 | 8.8618 | 33.9619 | 26.330 | 171.35 | 0.364 | 0.1279 | 91.080 | 3.5442 |
| 200.0 | 8.0397 | 34.0259 | 26.506 | 155.28 | 0.445 | 0.0513 | 91.120 | 3.5885 |
| 250.0 | 7.2101 | 34.0501 | 26.645 | 142.58 | 0.519 | -0.0501 | 91.170 | 3.0677 |
| 300.0 | 6.6501 | 34.0800 | 26.745 | 133.54 | 0.588 | -0.1034 | 91.130 | 2.2207 |
| 350.0 | 6.1891 | 34.0869 | 26.811 | 127.68 | 0.654 | -0.1587 | 91.120 | 1.8878 |
| 400.0 | 5.7479 | 34.0952 | 26.873 | 122.10 | 0.716 | -0.2078 | 91.140 | 1.5963 |
| 450.0 | 5.4725 | 34.1517 | 26.952 | 115.07 | 0.775 | -0.1969 | 91.150 | 0.9135 |
| 500.0 | 5.2289 | 34.1970 | 27.017 | 109.28 | 0.832 | -0.1902 | 91.170 | 0.6222 |
| 550.0 | 4.9138 | 34.2220 | 27.073 | 104.15 | 0.885 | -0.2069 | 91.180 | 0.4058 |
| 600.0 | 4.7807 | 34.2833 | 27.137 | 98.52 | 0.936 | -0.1738 | 91.190 | 0.2292 |
| 650.0 | 4.6355 | 34.3094 | 27.174 | 95.35 | 0.984 | -0.1696 | 91.190 | 0.1724 |
| 700.0 | 4.5114 | 34.3433 | 27.215 | 91.85 | 1.031 | -0.1567 | 91.180 | 0.1542 |
| 750.0 | 4.3231 | 34.3740 | 27.260 | 87.81 | 1.076 | -0.1529 | 91.190 | 0.1639 |
| 800.0 | 4.2036 | 34.4026 | 27.296 | 84.74 | 1.119 | -0.1433 | 91.200 | 0.2081 |
| 1000.0 | 3.6634 | 34.4678 | 27.404 | 75.27 | 1.278 | -0.1475 | 91.220 | 0.4986 |
| 1012.0 | 3.6434 | 34.4735 | 27.411 | 74.71 | 1.287 | -0.1451 | 91.210 | 0.5529 |

**STATION:** 21 **DATE:** May 5, 1999 1136 UT
**LATITUDE:** 34° 44.32 N. **LONGITUDE:** 124° 09.04 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 12.5743 | 33.0929 | 24.999 | 294.93 | 0.006 | 0.1058 | 88.450 | 8.7735 |
| 5.0 | 12.5757 | 33.0929 | 24.999 | 295.02 | 0.015 | 0.1060 | 88.510 | 8.7785 |
| 10.0 | 12.5825 | 33.0935 | 24.998 | 295.22 | 0.030 | 0.1077 | 88.530 | 8.8524 |
| 15.0 | 12.5816 | 33.0935 | 24.998 | 295.32 | 0.044 | 0.1073 | 88.545 | 8.9466 |
| 20.0 | 12.5839 | 33.0931 | 24.998 | 295.51 | 0.059 | 0.1074 | 88.540 | 9.0378 |
| 25.0 | 12.5837 | 33.0934 | 24.998 | 295.60 | 0.074 | 0.1074 | 88.555 | 9.1819 |
| 30.0 | 12.5615 | 33.0918 | 25.001 | 295.42 | 0.089 | 0.1016 | 88.560 | 9.1076 |
| 40.0 | 12.5245 | 33.0853 | 25.004 | 295.45 | 0.118 | 0.0888 | 88.570 | 9.0934 |
| 50.0 | 12.0288 | 33.0304 | 25.055 | 290.72 | 0.148 | -0.0526 | 88.970 | 9.0332 |
| 60.0 | 11.8580 | 33.0141 | 25.075 | 289.10 | 0.177 | -0.0988 | 89.760 | 8.7318 |
| 70.0 | 11.3168 | 33.0845 | 25.229 | 274.62 | 0.205 | -0.1452 | 90.080 | 8.6067 |
| 80.0 | 10.8818 | 33.2438 | 25.431 | 255.61 | 0.231 | -0.0982 | 90.700 | 7.2732 |
| 100.0 | 10.2448 | 33.5979 | 25.818 | 219.21 | 0.279 | 0.0701 | 90.890 | 5.8507 |
| 150.0 | 9.1925 | 33.9233 | 26.247 | 179.29 | 0.378 | 0.1503 | 91.020 | 3.9083 |
| 200.0 | 8.2425 | 34.0220 | 26.473 | 158.53 | 0.462 | 0.0787 | 91.040 | 3.5217 |
| 250.0 | 7.5483 | 34.0639 | 26.608 | 146.26 | 0.538 | 0.0087 | 91.120 | 2.9677 |
| 300.0 | 6.4360 | 34.0102 | 26.718 | 135.92 | 0.608 | -0.1869 | 91.120 | 3.2419 |
| 350.0 | 6.0072 | 34.0304 | 26.789 | 129.57 | 0.675 | -0.2264 | 91.120 | 2.5229 |
| 400.0 | 5.6713 | 34.0850 | 26.874 | 121.90 | 0.738 | -0.2252 | 91.100 | 1.5984 |
| 450.0 | 5.3578 | 34.1179 | 26.939 | 116.18 | 0.797 | -0.2371 | 91.120 | 1.1165 |
| 500.0 | 5.2070 | 34.1668 | 26.995 | 111.26 | 0.854 | -0.2166 | 91.120 | 0.7472 |
| 550.0 | 5.1163 | 34.2144 | 27.044 | 107.16 | 0.908 | -0.1899 | 91.130 | 0.4984 |
| 600.0 | 4.9646 | 34.2865 | 27.119 | 100.49 | 0.960 | -0.1508 | 91.100 | 0.2503 |
| 650.0 | 4.7585 | 34.3303 | 27.177 | 95.27 | 1.009 | -0.1397 | 91.070 | 0.1707 |
| 700.0 | 4.6005 | 34.3610 | 27.220 | 91.59 | 1.056 | -0.1332 | 91.050 | 0.1699 |
| 750.0 | 4.4095 | 34.3807 | 27.256 | 88.34 | 1.101 | -0.1385 | 91.060 | 0.1815 |
| 800.0 | 4.2613 | 34.4016 | 27.289 | 85.49 | 1.144 | -0.1381 | 91.080 | 0.2083 |
| 1000.0 | 3.6766 | 34.4640 | 27.400 | 75.70 | 1.305 | -0.1492 | 91.170 | 0.4760 |
| 1200.0 | 3.2580 | 34.5159 | 27.483 | 68.46 | 1.449 | -0.1493 | 91.160 | 0.8636 |
| 1400.0 | 2.8926 | 34.5451 | 27.541 | 63.34 | 1.581 | -0.1602 | 91.220 | 1.1783 |
| 1600.0 | 2.5557 | 34.5725 | 27.593 | 58.49 | 1.702 | -0.1684 | 91.220 | 1.5223 |
| 1800.0 | 2.2667 | 34.5952 | 27.636 | 54.39 | 1.815 | -0.1751 | 91.220 | 1.8653 |
| 2000.0 | 2.0775 | 34.6174 | 27.670 | 51.36 | 1.921 | -0.1735 | 91.200 | 2.2912 |
| 2200.0 | 1.9166 | 34.6311 | 27.694 | 49.17 | 2.021 | -0.1760 | 91.220 | 2.6034 |
| 2400.0 | 1.8183 | 34.6419 | 27.712 | 47.88 | 2.118 | -0.1759 | 91.220 | 2.8846 |
| 2600.0 | 1.7420 | 34.6515 | 27.726 | 46.89 | 2.213 | -0.1751 | 91.220 | 3.1576 |
| 2800.0 | 1.6699 | 34.6584 | 27.738 | 46.08 | 2.306 | -0.1760 | 91.200 | 3.4082 |
| 3000.0 | 1.6129 | 34.6647 | 27.749 | 45.47 | 2.397 | -0.1763 | 91.170 | 3.6115 |
| 3200.0 | 1.5794 | 34.6686 | 27.756 | 45.31 | 2.488 | -0.1769 | 91.130 | 3.7679 |
| 3400.0 | 1.5422 | 34.6728 | 27.763 | 45.05 | 2.578 | -0.1775 | 91.170 | 3.9323 |
| 3600.0 | 1.5174 | 34.6763 | 27.769 | 44.99 | 2.668 | -0.1778 | 91.160 | 4.0823 |
| 3800.0 | 1.4949 | 34.6805 | 27.775 | 44.88 | 2.758 | -0.1774 | 91.170 | 4.3052 |
| 4000.0 | 1.4888 | 34.6834 | 27.779 | 45.11 | 2.848 | -0.1769 | 91.150 | 4.4862 |
| 4200.0 | 1.4992 | 34.6850 | 27.782 | 45.68 | 2.939 | -0.1765 | 91.100 | 4.5857 |
| 4274.0 | 1.5050 | 34.6855 | 27.782 | 45.93 | 2.973 | -0.1763 | 91.100 | 4.6078 |

**STATION:** 22 **DATE:** May 5, 1999 1607 UT
**LATITUDE:** 34° 51.94 N. **LONGITUDE:** 124° 00.25 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 12.6991 | 33.3021 | 25.137 | 281.80 | 0.006 | 0.2971 | 87.830 | 8.8881 |
| 5.0 | 12.7006 | 33.3034 | 25.138 | 281.81 | 0.014 | 0.2984 | 88.025 | 8.8206 |
| 10.0 | 12.7018 | 33.3039 | 25.138 | 281.91 | 0.028 | 0.2989 | 88.010 | 8.8044 |
| 15.0 | 12.6986 | 33.3039 | 25.139 | 281.97 | 0.042 | 0.2981 | 87.960 | 8.8021 |
| 20.0 | 12.6936 | 33.3035 | 25.139 | 282.02 | 0.056 | 0.2967 | 87.920 | 8.7888 |
| 25.0 | 12.6981 | 33.3036 | 25.139 | 282.22 | 0.070 | 0.2975 | 88.005 | 8.7784 |
| 30.0 | 12.6995 | 33.3036 | 25.139 | 282.36 | 0.085 | 0.2977 | 88.000 | 8.7642 |
| 40.0 | 12.6977 | 33.3036 | 25.139 | 282.57 | 0.113 | 0.2971 | 88.000 | 8.7376 |
| 50.0 | 12.6975 | 33.3031 | 25.139 | 282.84 | 0.141 | 0.2963 | 88.050 | 8.7064 |
| 60.0 | 12.6982 | 33.3036 | 25.140 | 283.05 | 0.169 | 0.2966 | 87.880 | 8.6831 |
| 70.0 | 12.6901 | 33.3075 | 25.145 | 282.85 | 0.198 | 0.2978 | 88.050 | 8.6582 |
| 80.0 | 11.4753 | 33.2753 | 25.349 | 263.50 | 0.225 | 0.0365 | 90.190 | 8.2763 |
| 100.0 | 10.5792 | 33.5801 | 25.746 | 226.07 | 0.275 | 0.1148 | 90.840 | 6.2155 |
| 150.0 | 9.1757 | 33.8798 | 26.216 | 182.25 | 0.375 | 0.1132 | 90.810 | 4.2875 |
| 200.0 | 8.2049 | 34.0241 | 26.480 | 157.82 | 0.459 | 0.0746 | 90.960 | 3.6472 |
| 250.0 | 7.2952 | 34.0076 | 26.599 | 146.92 | 0.535 | -0.0718 | 90.970 | 4.1166 |
| 300.0 | 6.6308 | 34.0050 | 26.688 | 138.86 | 0.606 | -0.1654 | 90.980 | 3.6078 |
| 350.0 | 6.1756 | 34.0188 | 26.759 | 132.58 | 0.674 | -0.2143 | 90.930 | 3.0230 |
| 400.0 | 5.8086 | 34.0421 | 26.824 | 126.81 | 0.739 | -0.2423 | 90.970 | 2.2070 |
| 450.0 | 5.5958 | 34.0939 | 26.891 | 120.89 | 0.801 | -0.2278 | 90.980 | 1.4355 |
| 500.0 | 5.5679 | 34.1871 | 26.969 | 114.20 | 0.859 | -0.1580 | 90.970 | 0.7447 |
| 550.0 | 5.3678 | 34.2274 | 27.025 | 109.29 | 0.915 | -0.1505 | 90.980 | 0.4877 |
| 600.0 | 5.0757 | 34.2835 | 27.104 | 102.07 | 0.968 | -0.1405 | 90.920 | 0.2818 |
| 650.0 | 4.8775 | 34.3193 | 27.155 | 97.52 | 1.018 | -0.1351 | 90.910 | 0.2012 |
| 700.0 | 4.7217 | 34.3426 | 27.192 | 94.42 | 1.066 | -0.1345 | 90.890 | 0.1745 |
| 750.0 | 4.5436 | 34.3693 | 27.233 | 90.79 | 1.112 | -0.1332 | 90.930 | 0.1729 |
| 800.0 | 4.3403 | 34.3971 | 27.277 | 86.77 | 1.157 | -0.1334 | 90.860 | 0.2069 |
| 1000.0 | 3.7000 | 34.4575 | 27.392 | 76.46 | 1.320 | -0.1521 | 91.070 | 0.4391 |
| 1028.0 | 3.6550 | 34.4732 | 27.410 | 74.99 | 1.341 | -0.1443 | 91.040 | 0.5084 |

**STATION:** 23 **DATE:** May 5, 1999 1849 UT
**LATITUDE:** 35° 00.14 N. **LONGITUDE:** 123° 51.72 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 12.6559 | 33.3001 | 25.144 | 281.15 | 0.006 | 0.2869 | 88.240 | 9.0179 |
| 5.0 | 12.6568 | 33.3001 | 25.144 | 281.23 | 0.014 | 0.2870 | 88.285 | 9.0089 |
| 10.0 | 12.6542 | 33.3005 | 25.145 | 281.28 | 0.028 | 0.2867 | 88.360 | 8.9805 |
| 15.0 | 12.6472 | 33.3005 | 25.146 | 281.26 | 0.042 | 0.2852 | 88.380 | 8.9606 |
| 20.0 | 12.6408 | 33.3009 | 25.148 | 281.24 | 0.056 | 0.2841 | 88.380 | 8.9475 |
| 25.0 | 12.6357 | 33.3004 | 25.148 | 281.29 | 0.070 | 0.2825 | 88.380 | 8.9212 |
| 30.0 | 12.6235 | 33.3002 | 25.151 | 281.20 | 0.084 | 0.2798 | 88.370 | 8.9112 |
| 40.0 | 12.5953 | 33.3004 | 25.157 | 280.90 | 0.112 | 0.2741 | 88.340 | 8.8691 |
| 50.0 | 12.5889 | 33.3008 | 25.158 | 280.99 | 0.141 | 0.2728 | 88.400 | 8.8302 |
| 60.0 | 12.5826 | 33.3060 | 25.164 | 280.73 | 0.169 | 0.2755 | 88.680 | 8.7684 |
| 70.0 | 12.4550 | 33.3263 | 25.205 | 277.11 | 0.197 | 0.2660 | 89.610 | 8.6862 |
| 80.0 | 11.4835 | 33.3134 | 25.377 | 260.83 | 0.224 | 0.0683 | 89.960 | 8.3874 |
| 100.0 | 10.3374 | 33.6523 | 25.844 | 216.71 | 0.272 | 0.1295 | 90.660 | 6.1169 |
| 150.0 | 8.9608 | 33.9083 | 26.272 | 176.84 | 0.368 | 0.1012 | 90.770 | 4.1795 |
| 200.0 | 8.1942 | 34.0114 | 26.471 | 158.61 | 0.451 | 0.0630 | 90.780 | 4.2773 |
| 250.0 | 7.4590 | 34.0138 | 26.581 | 148.73 | 0.527 | -0.0437 | 90.820 | 4.1464 |
| 300.0 | 6.6746 | 34.0113 | 26.688 | 138.97 | 0.599 | -0.1546 | 90.840 | 3.6049 |
| 350.0 | 6.2106 | 34.0254 | 26.760 | 132.54 | 0.667 | -0.2046 | 90.870 | 2.7246 |
| 400.0 | 5.9334 | 34.0679 | 26.829 | 126.47 | 0.732 | -0.2065 | 90.870 | 1.9306 |
| 450.0 | 5.6184 | 34.1116 | 26.902 | 119.86 | 0.793 | -0.2111 | 90.850 | 1.3203 |
| 500.0 | 5.3857 | 34.1632 | 26.972 | 113.71 | 0.851 | -0.1986 | 90.880 | 0.8379 |
| 550.0 | 5.3014 | 34.2299 | 27.035 | 108.28 | 0.907 | -0.1563 | 90.920 | 0.4705 |
| 600.0 | 5.0948 | 34.2710 | 27.092 | 103.23 | 0.960 | -0.1482 | 90.880 | 0.2946 |
| 650.0 | 4.9406 | 34.3105 | 27.141 | 98.95 | 1.010 | -0.1350 | 90.820 | 0.2052 |
| 700.0 | 4.6956 | 34.3458 | 27.197 | 93.87 | 1.058 | -0.1348 | 90.840 | 0.1741 |
| 750.0 | 4.5458 | 34.3690 | 27.232 | 90.83 | 1.104 | -0.1332 | 90.810 | 0.1768 |
| 800.0 | 4.3766 | 34.3915 | 27.269 | 87.62 | 1.149 | -0.1340 | 90.850 | 0.1979 |
| 1000.0 | 3.7423 | 34.4649 | 27.394 | 76.40 | 1.312 | -0.1422 | 90.980 | 0.4661 |
| 1010.0 | 3.7301 | 34.4656 | 27.396 | 76.29 | 1.320 | -0.1429 | 90.950 | 0.4979 |

**STATION:** 24 **DATE:** May 5, 1999 2125 UT
**LATITUDE:** 35° 07.94 N. **LONGITUDE:** 123° 43.02 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 12.6769 | 33.3165 | 25.152 | 280.33 | 0.006 | 0.3041 | 88.060 | 9.0542 |
| 5.0 | 12.6757 | 33.3167 | 25.153 | 280.37 | 0.014 | 0.3039 | 88.050 | 9.0427 |
| 10.0 | 12.6785 | 33.3162 | 25.152 | 280.57 | 0.028 | 0.3040 | 88.100 | 9.0317 |
| 15.0 | 12.6770 | 33.3166 | 25.153 | 280.64 | 0.042 | 0.3038 | 88.095 | 9.0148 |
| 20.0 | 12.6515 | 33.3176 | 25.159 | 280.20 | 0.056 | 0.2995 | 88.000 | 9.0021 |
| 25.0 | 12.6057 | 33.3176 | 25.168 | 279.47 | 0.070 | 0.2902 | 88.020 | 8.9979 |
| 30.0 | 12.5852 | 33.3166 | 25.171 | 279.29 | 0.084 | 0.2852 | 87.990 | 8.9802 |
| 40.0 | 12.5572 | 33.3154 | 25.176 | 279.09 | 0.112 | 0.2784 | 88.060 | 8.9321 |
| 50.0 | 12.4634 | 33.3218 | 25.199 | 277.13 | 0.140 | 0.2646 | 88.790 | 8.8316 |
| 60.0 | 12.4032 | 33.3303 | 25.217 | 275.63 | 0.167 | 0.2592 | 89.420 | 8.7036 |
| 70.0 | 12.1287 | 33.3095 | 25.254 | 272.39 | 0.195 | 0.1887 | 89.810 | 8.5206 |
| 80.0 | 10.7025 | 33.4486 | 25.622 | 237.44 | 0.221 | 0.0327 | 90.320 | 7.5085 |
| 100.0 | 10.2679 | 33.6714 | 25.871 | 214.15 | 0.266 | 0.1325 | 90.660 | 5.2481 |
| 150.0 | 9.0084 | 33.9026 | 26.260 | 177.99 | 0.362 | 0.1043 | 90.790 | 4.0586 |
| 200.0 | 8.1221 | 34.0157 | 26.486 | 157.23 | 0.445 | 0.0555 | 90.840 | 4.4625 |
| 250.0 | 7.4052 | 34.0273 | 26.599 | 146.98 | 0.521 | -0.0407 | 90.270 | 3.8523 |
| 300.0 | 6.6021 | 34.0114 | 26.697 | 138.01 | 0.592 | -0.1641 | 90.780 | 3.4661 |
| 350.0 | 6.0588 | 34.0433 | 26.793 | 129.26 | 0.659 | -0.2097 | 90.840 | 2.3634 |
| 400.0 | 5.8687 | 34.0999 | 26.862 | 123.27 | 0.722 | -0.1892 | 90.830 | 1.6052 |
| 450.0 | 5.5119 | 34.1236 | 26.925 | 117.64 | 0.782 | -0.2144 | 90.860 | 1.1433 |
| 500.0 | 5.0890 | 34.1512 | 26.997 | 110.99 | 0.839 | -0.2425 | 90.860 | 0.8188 |
| 550.0 | 5.1736 | 34.2450 | 27.062 | 105.58 | 0.894 | -0.1592 | 90.820 | 0.3902 |
| 600.0 | 5.0291 | 34.2789 | 27.106 | 101.84 | 0.945 | -0.1495 | 90.840 | 0.2610 |
| 650.0 | 4.8619 | 34.3111 | 27.151 | 97.94 | 0.995 | -0.1433 | 90.830 | 0.1934 |
| 700.0 | 4.6571 | 34.3446 | 27.200 | 93.49 | 1.043 | -0.1400 | 90.840 | 0.1633 |
| 750.0 | 4.5460 | 34.3653 | 27.229 | 91.11 | 1.089 | -0.1361 | 90.790 | 0.1704 |
| 800.0 | 4.4199 | 34.3852 | 27.259 | 88.60 | 1.134 | -0.1343 | 90.790 | 0.1906 |
| 1000.0 | 3.7902 | 34.4612 | 27.386 | 77.24 | 1.299 | -0.1404 | 90.860 | 0.4448 |
| 1012.0 | 3.7595 | 34.4638 | 27.392 | 76.78 | 1.308 | -0.1415 | 90.860 | 0.4699 |

**STATION:** 25 **DATE:** May 5, 1999 2350 UT
**LATITUDE:** 35° 15.62, N. **LONGITUDE:** 123° 34.20 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 12.6502 | 33.3182 | 25.159 | 279.71 | 0.006 | 0.3001 | 88.330 | 9.1214 |
| 5.0 | 12.6523 | 33.3182 | 25.158 | 279.82 | 0.014 | 0.3005 | 88.475 | 8.9976 |
| 10.0 | 12.6401 | 33.3185 | 25.161 | 279.69 | 0.028 | 0.2982 | 88.430 | 8.9810 |
| 15.0 | 12.6414 | 33.3183 | 25.161 | 279.85 | 0.042 | 0.2981 | 88.425 | 8.9686 |
| 20.0 | 12.6315 | 33.3185 | 25.163 | 279.77 | 0.056 | 0.2962 | 88.360 | 8.9485 |
| 25.0 | 12.6128 | 33.3203 | 25.168 | 279.41 | 0.070 | 0.2937 | 88.205 | 8.9361 |
| 30.0 | 12.5831 | 33.3198 | 25.174 | 279.01 | 0.084 | 0.2873 | 87.740 | 8.9373 |
| 40.0 | 12.5620 | 33.3231 | 25.181 | 278.62 | 0.112 | 0.2855 | 87.660 | 8.8895 |
| 50.0 | 12.5413 | 33.3225 | 25.184 | 278.51 | 0.140 | 0.2806 | 88.040 | 8.8220 |
| 60.0 | 12.5049 | 33.3253 | 25.194 | 277.87 | 0.167 | 0.2753 | 88.550 | 8.7693 |
| 70.0 | 11.6068 | 33.3960 | 25.418 | 256.68 | 0.195 | 0.1575 | 89.760 | 8.3422 |
| 80.0 | 10.0855 | 33.6027 | 25.848 | 215.86 | 0.218 | 0.0468 | 90.510 | 6.0282 |
| 100.0 | 9.4701 | 33.7930 | 26.099 | 192.34 | 0.259 | 0.0935 | 90.670 | 4.5178 |
| 150.0 | 8.7277 | 33.9812 | 26.366 | 167.89 | 0.347 | 0.1220 | 90.750 | 3.5931 |
| 200.0 | 7.9199 | 34.0070 | 26.509 | 154.96 | 0.427 | 0.0185 | 90.770 | 4.3985 |
| 250.0 | 7.5116 | 34.0514 | 26.603 | 146.67 | 0.503 | -0.0065 | 90.750 | 3.2837 |
| 300.0 | 6.7600 | 34.0229 | 26.685 | 139.25 | 0.574 | -0.1339 | 90.790 | 3.2610 |
| 350.0 | 6.1696 | 34.0333 | 26.771 | 131.42 | 0.642 | -0.2036 | 90.780 | 2.6662 |
| 400.0 | 5.8473 | 34.0796 | 26.849 | 124.51 | 0.706 | -0.2079 | 90.760 | 1.7680 |
| 450.0 | 5.4652 | 34.1019 | 26.913 | 118.68 | 0.766 | -0.2371 | 90.790 | 1.2799 |
| 500.0 | 5.1541 | 34.1494 | 26.988 | 111.91 | 0.824 | -0.2364 | 90.830 | 0.8413 |
| 550.0 | 4.8844 | 34.1868 | 27.049 | 106.42 | 0.878 | -0.2379 | 90.850 | 0.5606 |
| 600.0 | 4.7139 | 34.2406 | 27.111 | 100.90 | 0.930 | -0.2148 | 90.850 | 0.3327 |
| 650.0 | 4.8002 | 34.3162 | 27.162 | 96.82 | 0.980 | -0.1462 | 90.760 | 0.1930 |
| 700.0 | 4.6858 | 34.3438 | 27.197 | 93.90 | 1.028 | -0.1375 | 90.740 | 0.1674 |
| 750.0 | 4.5201 | 34.3694 | 27.236 | 90.50 | 1.074 | -0.1357 | 90.730 | 0.1712 |
| 800.0 | 4.3456 | 34.3969 | 27.277 | 86.84 | 1.118 | -0.1330 | 90.700 | 0.2032 |
| 1000.0 | 3.8653 | 34.4546 | 27.374 | 78.62 | 1.283 | -0.1382 | 90.690 | 0.4023 |
| 1200.0 | 3.3568 | 34.5081 | 27.467 | 70.20 | 1.432 | -0.1463 | 90.860 | 0.7856 |
| 1400.0 | 2.9722 | 34.5455 | 27.534 | 64.24 | 1.566 | -0.1530 | 90.880 | 1.1620 |
| 1600.0 | 2.6044 | 34.5736 | 27.590 | 58.99 | 1.689 | -0.1636 | 90.880 | 1.5341 |
| 1800.0 | 2.2810 | 34.5941 | 27.634 | 54.64 | 1.803 | -0.1748 | 90.910 | 1.8532 |
| 2000.0 | 2.0951 | 34.6162 | 27.668 | 51.66 | 1.909 | -0.1731 | 90.910 | 2.2634 |
| 2200.0 | 1.9457 | 34.6296 | 27.691 | 49.65 | 2.010 | -0.1750 | 90.910 | 2.5789 |
| 2400.0 | 1.8326 | 34.6407 | 27.710 | 48.15 | 2.108 | -0.1758 | 90.900 | 2.8389 |
| 2600.0 | 1.7374 | 34.6504 | 27.726 | 46.91 | 2.203 | -0.1763 | 90.890 | 3.1156 |
| 2800.0 | 1.6790 | 34.6591 | 27.738 | 46.16 | 2.296 | -0.1749 | 90.870 | 3.4361 |
| 3000.0 | 1.6307 | 34.6636 | 27.747 | 45.80 | 2.388 | -0.1760 | 90.860 | 3.5840 |
| 3200.0 | 1.5910 | 34.6677 | 27.754 | 45.55 | 2.479 | -0.1768 | 90.860 | 3.7332 |
| 3400.0 | 1.5677 | 34.6719 | 27.760 | 45.49 | 2.570 | -0.1765 | 90.840 | 3.9004 |
| 3600.0 | 1.5389 | 34.6752 | 27.767 | 45.39 | 2.661 | -0.1772 | 90.840 | 4.0202 |
| 3800.0 | 1.5121 | 34.6795 | 27.773 | 45.22 | 2.751 | -0.1770 | 90.810 | 4.2039 |
| 4000.0 | 1.4962 | 34.6835 | 27.779 | 45.22 | 2.842 | -0.1764 | 90.760 | 4.4134 |
| 4036.0 | 1.4959 | 34.6841 | 27.780 | 45.27 | 2.858 | -0.1762 | 90.730 | 4.4394 |

**STATION:** 26 **DATE:** May 6, 1999 0356 UT
**LATITUDE:** 35° 23.32 N. **LONGITUDE:** 123° 25.66 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 12.6102 | 33.3777 | 25.213 | 274.58 | 0.005 | 0.3394 | 87.500 | 7.3330 |
| 5.0 | 12.6111 | 33.3777 | 25.213 | 274.67 | 0.014 | 0.3394 | 87.510 | 7.4899 |
| 10.0 | 12.6118 | 33.3779 | 25.213 | 274.79 | 0.027 | 0.3397 | 87.440 | 8.5603 |
| 15.0 | 12.6138 | 33.3780 | 25.213 | 274.93 | 0.041 | 0.3400 | 87.580 | 9.4755 |
| 20.0 | 12.6123 | 33.3782 | 25.213 | 275.01 | 0.055 | 0.3397 | 87.600 | 9.9287 |
| 25.0 | 12.6135 | 33.3781 | 25.213 | 275.16 | 0.069 | 0.3398 | 87.600 | 10.2206 |
| 30.0 | 12.6091 | 33.3773 | 25.213 | 275.26 | 0.082 | 0.3381 | 87.440 | 10.1677 |
| 40.0 | 12.5923 | 33.3768 | 25.216 | 275.22 | 0.110 | 0.3341 | 87.700 | 9.7710 |
| 50.0 | 12.5248 | 33.3753 | 25.229 | 274.32 | 0.137 | 0.3192 | 88.290 | 9.2501 |
| 60.0 | 12.5216 | 33.3750 | 25.229 | 274.51 | 0.165 | 0.3181 | 88.600 | 8.5451 |
| 70.0 | 12.3750 | 33.3747 | 25.257 | 272.07 | 0.192 | 0.2887 | 89.160 | 7.9362 |
| 80.0 | 10.9453 | 33.5319 | 25.644 | 235.39 | 0.218 | 0.1427 | 90.010 | 7.5977 |
| 100.0 | 10.2141 | 33.6718 | 25.881 | 213.24 | 0.263 | 0.1235 | 90.510 | 5.5827 |
| 150.0 | 8.7110 | 33.9530 | 26.346 | 169.73 | 0.355 | 0.0971 | 90.690 | 3.2962 |
| 200.0 | 8.0025 | 34.0488 | 26.529 | 153.04 | 0.435 | 0.0638 | 90.670 | 2.6068 |
| 250.0 | 7.3689 | 34.0598 | 26.630 | 144.06 | 0.509 | -0.0201 | 90.720 | 2.1008 |
| 300.0 | 6.6548 | 34.0701 | 26.737 | 134.34 | 0.578 | -0.1107 | 90.750 | 1.8110 |
| 350.0 | 6.0628 | 34.0484 | 26.797 | 128.93 | 0.644 | -0.2051 | 90.730 | 1.5514 |
| 400.0 | 5.5775 | 34.0728 | 26.876 | 121.65 | 0.707 | -0.2462 | 90.730 | 1.3005 |
| 450.0 | 5.3520 | 34.1269 | 26.946 | 115.44 | 0.766 | -0.2307 | 90.740 | 0.9577 |
| 500.0 | 5.1506 | 34.1521 | 26.990 | 111.67 | 0.823 | -0.2347 | 90.740 | 0.6715 |
| 550.0 | 4.8830 | 34.1909 | 27.052 | 106.10 | 0.878 | -0.2349 | 90.760 | 0.4868 |
| 600.0 | 4.7354 | 34.2512 | 27.117 | 100.37 | 0.930 | -0.2041 | 90.760 | 0.3086 |
| 650.0 | 4.8004 | 34.3172 | 27.162 | 96.75 | 0.979 | -0.1454 | 90.670 | 0.1819 |
| 700.0 | 4.6430 | 34.3499 | 27.206 | 92.93 | 1.026 | -0.1373 | 90.670 | 0.0953 |
| 750.0 | 4.4564 | 34.3746 | 27.247 | 89.35 | 1.072 | -0.1384 | 90.690 | 0.0575 |
| 800.0 | 4.3354 | 34.3940 | 27.275 | 86.94 | 1.116 | -0.1363 | 90.680 | 0.0481 |
| 1000.0 | 3.7749 | 34.4645 | 27.391 | 76.82 | 1.280 | -0.1393 | 90.670 | 0.1397 |
| 1010.0 | 3.7336 | 34.4663 | 27.396 | 76.28 | 1.287 | -0.1420 | 90.690 | 0.1752 |

**STATION:** 27 **DATE:** May 6, 1999 0617 UT
**LATITUDE:** 35° 31.17 N. **LONGITUDE:** 123° 16.80 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 12.4549 | 33.3569 | 25.227 | 273.26 | 0.005 | 0.2920 | 87.280 | 7.8389 |
| 5.0 | 12.4545 | 33.3569 | 25.227 | 273.32 | 0.014 | 0.2919 | 87.290 | 7.8326 |
| 10.0 | 12.4501 | 33.3563 | 25.227 | 273.40 | 0.027 | 0.2904 | 87.200 | 7.8300 |
| 15.0 | 12.4602 | 33.3575 | 25.226 | 273.62 | 0.041 | 0.2932 | 87.320 | 7.8235 |
| 20.0 | 12.4701 | 33.3605 | 25.227 | 273.70 | 0.055 | 0.2974 | 87.300 | 7.8000 |
| 25.0 | 12.4699 | 33.3606 | 25.227 | 273.80 | 0.068 | 0.2973 | 87.385 | 7.7997 |
| 30.0 | 12.4866 | 33.3658 | 25.228 | 273.84 | 0.082 | 0.3047 | 87.400 | 7.7832 |
| 40.0 | 12.5039 | 33.3768 | 25.234 | 273.59 | 0.109 | 0.3166 | 87.930 | 7.7232 |
| 50.0 | 12.5139 | 33.3828 | 25.237 | 273.56 | 0.137 | 0.3230 | 88.030 | 7.6793 |
| 60.0 | 12.5066 | 33.3903 | 25.244 | 273.11 | 0.164 | 0.3273 | 88.640 | 7.6184 |
| 70.0 | 12.4326 | 33.3894 | 25.258 | 272.05 | 0.191 | 0.3117 | 89.110 | 7.5683 |
| 80.0 | 12.1684 | 33.4077 | 25.323 | 266.10 | 0.218 | 0.2742 | 89.470 | 7.4317 |
| 100.0 | 10.0516 | 33.6079 | 25.858 | 215.32 | 0.265 | 0.0447 | 90.430 | 5.1321 |
| 150.0 | 8.8995 | 33.8863 | 26.264 | 177.53 | 0.363 | 0.0740 | 90.190 | 3.7788 |
| 200.0 | 8.2756 | 34.0159 | 26.463 | 159.46 | 0.447 | 0.0788 | 90.530 | 3.4523 |
| 250.0 | 7.5588 | 34.0322 | 26.581 | 148.76 | 0.524 | -0.0149 | 90.610 | 3.2340 |
| 300.0 | 6.7969 | 34.0559 | 26.706 | 137.29 | 0.595 | -0.1029 | 90.670 | 2.5732 |
| 350.0 | 6.3511 | 34.1000 | 26.801 | 128.81 | 0.662 | -0.1275 | 90.650 | 1.7303 |
| 400.0 | 6.1101 | 34.1475 | 26.869 | 122.81 | 0.725 | -0.1214 | 90.660 | 1.1355 |
| 450.0 | 5.7706 | 34.1866 | 26.943 | 116.19 | 0.785 | -0.1333 | 90.670 | 0.7846 |
| 500.0 | 5.4501 | 34.2252 | 27.013 | 109.90 | 0.841 | -0.1420 | 90.670 | 0.4997 |
| 550.0 | 5.1908 | 34.2565 | 27.069 | 104.94 | 0.895 | -0.1481 | 90.660 | 0.3219 |
| 600.0 | 4.9142 | 34.2929 | 27.130 | 99.41 | 0.946 | -0.1514 | 90.620 | 0.2210 |
| 650.0 | 4.7214 | 34.3090 | 27.165 | 96.41 | 0.995 | -0.1605 | 90.640 | 0.1582 |
| 700.0 | 4.5859 | 34.3511 | 27.213 | 92.15 | 1.042 | -0.1426 | 90.670 | 0.1279 |
| 750.0 | 4.4213 | 34.3702 | 27.247 | 89.26 | 1.087 | -0.1456 | 90.670 | 0.1271 |
| 800.0 | 4.2204 | 34.3843 | 27.280 | 86.30 | 1.131 | -0.1559 | 90.740 | 0.1333 |
| 1000.0 | 3.7308 | 34.4685 | 27.398 | 76.00 | 1.293 | -0.1405 | 90.700 | 0.3866 |
| 1010.0 | 3.7069 | 34.4697 | 27.402 | 75.71 | 1.300 | -0.1419 | 90.700 | 0.4075 |

**STATION:** 28 **DATE:** May 6, 1999 0838 UT
**LATITUDE:** 35° 39.21 N. **LONGITUDE:** 123° 08.07 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 11.3118 | 33.2453 | 25.353 | 261.24 | 0.010 | -0.0163 | 82.220 | 9.0836 |
| 5.0 | 11.3122 | 33.2458 | 25.354 | 261.22 | 0.013 | -0.0158 | 82.300 | 9.0892 |
| 10.0 | 11.3116 | 33.2460 | 25.354 | 261.31 | 0.026 | -0.0159 | 82.300 | 9.0916 |
| 15.0 | 11.3144 | 33.2467 | 25.354 | 261.41 | 0.039 | -0.0149 | 82.285 | 9.1664 |
| 20.0 | 11.3147 | 33.2468 | 25.354 | 261.52 | 0.052 | -0.0149 | 82.350 | 9.1825 |
| 25.0 | 11.3151 | 33.2464 | 25.354 | 261.66 | 0.065 | -0.0152 | 82.390 | 9.1754 |
| 30.0 | 11.3637 | 33.2841 | 25.375 | 259.82 | 0.078 | 0.0237 | 83.600 | 9.0230 |
| 40.0 | 11.1164 | 33.3529 | 25.473 | 250.70 | 0.104 | 0.0325 | 83.800 | 8.5718 |
| 50.0 | 10.9848 | 33.4053 | 25.538 | 244.79 | 0.129 | 0.0499 | 84.460 | 8.4438 |
| 60.0 | 10.8659 | 33.4671 | 25.607 | 238.41 | 0.153 | 0.0773 | 85.930 | 7.3216 |
| 70.0 | 10.3490 | 33.6050 | 25.805 | 219.79 | 0.176 | 0.0946 | 88.470 | 5.9549 |
| 80.0 | 9.9145 | 33.6960 | 25.950 | 206.19 | 0.197 | 0.0915 | 89.870 | 4.9517 |
| 100.0 | 9.4555 | 33.7984 | 26.106 | 191.71 | 0.237 | 0.0953 | 90.090 | 4.5327 |
| 150.0 | 8.5509 | 33.9958 | 26.404 | 164.16 | 0.325 | 0.1060 | 90.300 | 3.9192 |
| 200.0 | 7.9516 | 34.0427 | 26.532 | 152.76 | 0.403 | 0.0515 | 90.380 | 3.3529 |
| 250.0 | 7.3071 | 34.0449 | 26.627 | 144.31 | 0.478 | -0.0406 | 90.480 | 3.1934 |
| 300.0 | 6.7772 | 34.0468 | 26.702 | 137.70 | 0.548 | -0.1127 | 90.540 | 2.7576 |
| 350.0 | 6.3044 | 34.0842 | 26.794 | 129.37 | 0.615 | -0.1460 | 90.550 | 1.8913 |
| 400.0 | 6.0884 | 34.1467 | 26.872 | 122.59 | 0.678 | -0.1247 | 90.550 | 1.1624 |
| 450.0 | 5.7575 | 34.1772 | 26.937 | 116.72 | 0.738 | -0.1423 | 90.570 | 0.8123 |
| 500.0 | 5.3257 | 34.1855 | 26.996 | 111.32 | 0.795 | -0.1880 | 90.580 | 0.6513 |
| 550.0 | 5.0916 | 34.2174 | 27.049 | 106.64 | 0.850 | -0.1904 | 90.600 | 0.4468 |
| 600.0 | 4.8003 | 34.2560 | 27.113 | 100.78 | 0.902 | -0.1932 | 90.610 | 0.2811 |
| 650.0 | 4.6362 | 34.2984 | 27.166 | 96.18 | 0.951 | -0.1782 | 90.610 | 0.1878 |
| 700.0 | 4.5666 | 34.3377 | 27.205 | 92.92 | 0.998 | -0.1552 | 90.610 | 0.1487 |
| 750.0 | 4.5034 | 34.3842 | 27.249 | 89.20 | 1.044 | -0.1258 | 90.560 | 0.1926 |
| 800.0 | 4.3923 | 34.4064 | 27.279 | 86.70 | 1.088 | -0.1206 | 90.540 | 0.2307 |
| 1000.0 | 3.8538 | 34.4575 | 27.377 | 78.27 | 1.252 | -0.1371 | 90.550 | 0.4080 |
| 1008.0 | 3.8351 | 34.4588 | 27.380 | 78.01 | 1.258 | -0.1379 | 90.540 | 0.4173 |

**STATION:** 29 **DATE:** May 6, 1999 1100 UT
**LATITUDE:** 35° 46.93 N. **LONGITUDE:** 122° 59.36 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 10.8880 | 33.3074 | 25.478 | 249.39 | 0.005 | -0.0446 | 78.800 | 7.5585 |
| 5.0 | 10.8886 | 33.3081 | 25.478 | 249.41 | 0.012 | -0.0440 | 78.670 | 7.9159 |
| 10.0 | 10.8892 | 33.3085 | 25.478 | 249.49 | 0.025 | -0.0437 | 78.640 | 8.9700 |
| 15.0 | 10.8907 | 33.3102 | 25.480 | 249.49 | 0.037 | -0.0421 | 78.690 | 9.9686 |
| 20.0 | 10.8918 | 33.3095 | 25.479 | 249.67 | 0.050 | -0.0427 | 78.700 | 10.7901 |
| 25.0 | 10.8898 | 33.3237 | 25.490 | 248.69 | 0.062 | -0.0319 | 78.600 | 11.1870 |
| 30.0 | 10.8744 | 33.3378 | 25.504 | 247.49 | 0.075 | -0.0235 | 78.790 | 11.4639 |
| 40.0 | 10.6977 | 33.3771 | 25.566 | 241.83 | 0.099 | -0.0242 | 81.190 | 11.4189 |
| 50.0 | 10.1801 | 33.4824 | 25.738 | 225.71 | 0.123 | -0.0320 | 88.650 | 10.9924 |
| 60.0 | 9.9346 | 33.5004 | 25.793 | 220.61 | 0.145 | -0.0601 | 87.990 | 10.2531 |
| 70.0 | 9.9572 | 33.6391 | 25.898 | 210.89 | 0.166 | 0.0538 | 89.140 | 9.2643 |
| 80.0 | 9.9568 | 33.7231 | 25.964 | 204.86 | 0.187 | 0.1202 | 89.750 | 8.3803 |
| 100.0 | 9.5988 | 33.9265 | 26.183 | 184.47 | 0.226 | 0.2206 | 89.990 | 7.4726 |
| 150.0 | 8.6897 | 34.0389 | 26.417 | 163.04 | 0.312 | 0.1617 | 90.190 | 5.6487 |
| 200.0 | 8.0014 | 34.0606 | 26.539 | 152.15 | 0.391 | 0.0730 | 90.120 | 4.2641 |
| 250.0 | 7.5399 | 34.1003 | 26.638 | 143.44 | 0.465 | 0.0363 | 90.390 | 3.2761 |
| 300.0 | 6.9592 | 34.1177 | 26.733 | 134.88 | 0.535 | -0.0320 | 90.310 | 2.6050 |
| 350.0 | 6.5387 | 34.1559 | 26.820 | 127.11 | 0.600 | -0.0588 | 90.460 | 2.1468 |
| 400.0 | 6.1295 | 34.1952 | 26.905 | 119.51 | 0.662 | -0.0812 | 90.460 | 1.7949 |
| 450.0 | 5.7184 | 34.2101 | 26.968 | 113.78 | 0.720 | -0.1211 | 90.470 | 1.4624 |
| 500.0 | 5.3238 | 34.2383 | 27.038 | 107.36 | 0.776 | -0.1465 | 90.430 | 1.1988 |
| 550.0 | 5.3186 | 34.2986 | 27.087 | 103.39 | 0.828 | -0.1001 | 89.940 | 1.0208 |
| 600.0 | 5.1670 | 34.3221 | 27.124 | 100.32 | 0.879 | -0.0997 | 89.970 | 0.8427 |
| 650.0 | 4.9971 | 34.3456 | 27.163 | 97.03 | 0.929 | -0.1010 | 90.040 | 0.6910 |
| 700.0 | 4.7847 | 34.3696 | 27.206 | 93.18 | 0.976 | -0.1063 | 89.900 | 0.5590 |
| 750.0 | 4.6040 | 34.3889 | 27.242 | 90.06 | 1.022 | -0.1113 | 90.130 | 0.4517 |
| 800.0 | 4.4641 | 34.4066 | 27.272 | 87.55 | 1.066 | -0.1128 | 90.110 | 0.3887 |
| 1000.0 | 3.8723 | 34.4622 | 27.379 | 78.14 | 1.233 | -0.1315 | 90.220 | 0.2339 |
| 1200.0 | 3.3379 | 34.5046 | 27.466 | 70.23 | 1.381 | -0.1508 | 90.530 | 0.2333 |
| 1400.0 | 2.9263 | 34.5396 | 27.533 | 64.14 | 1.516 | -0.1616 | 90.520 | 0.3248 |
| 1600.0 | 2.5974 | 34.5683 | 27.586 | 59.30 | 1.639 | -0.1683 | 90.500 | 0.4483 |
| 1800.0 | 2.2863 | 34.5937 | 27.633 | 54.73 | 1.753 | -0.1747 | 90.540 | 0.5845 |
| 2000.0 | 2.0788 | 34.6146 | 27.668 | 51.58 | 1.859 | -0.1756 | 90.560 | 0.7450 |
| 2200.0 | 1.9268 | 34.6339 | 27.696 | 49.10 | 1.960 | -0.1730 | 90.570 | 0.9096 |
| 2400.0 | 1.8220 | 34.6454 | 27.714 | 47.68 | 2.057 | -0.1729 | 90.550 | 1.0788 |
| 2600.0 | 1.7513 | 34.6534 | 27.727 | 46.88 | 2.151 | -0.1730 | 90.550 | 1.2236 |
| 2800.0 | 1.7157 | 34.6579 | 27.735 | 46.74 | 2.245 | -0.1733 | 90.530 | 1.3434 |
| 3000.0 | 1.6633 | 34.6632 | 27.744 | 46.28 | 2.338 | -0.1741 | 90.540 | 1.4258 |
| 3200.0 | 1.6176 | 34.6677 | 27.752 | 45.93 | 2.430 | -0.1750 | 90.540 | 1.5062 |
| 3400.0 | 1.5940 | 34.6708 | 27.758 | 45.95 | 2.522 | -0.1756 | 90.510 | 1.5675 |
| 3600.0 | 1.5701 | 34.6738 | 27.763 | 45.96 | 2.614 | -0.1762 | 90.480 | 1.6224 |
| 3708.0 | 1.5551 | 34.6764 | 27.767 | 45.85 | 2.663 | -0.1760 | 90.330 | 1.6448 |

**STATION:** 30 **DATE:** May 6, 1999 1518 UT
**LATITUDE:** 35° 54.48 N. **LONGITUDE:** 122° 50.43 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 10.8807 | 33.2043 | 25.399 | 256.90 | 0.005 | -0.1282 | 78.620 | 10.0662 |
| 5.0 | 10.8795 | 33.2040 | 25.399 | 256.96 | 0.013 | -0.1287 | 78.860 | 10.6094 |
| 10.0 | 10.8699 | 33.2102 | 25.405 | 256.45 | 0.026 | -0.1256 | 78.890 | 12.8068 |
| 15.0 | 10.8627 | 33.2158 | 25.411 | 256.02 | 0.038 | -0.1226 | 79.095 | 13.9177 |
| 20.0 | 10.8598 | 33.2174 | 25.413 | 255.95 | 0.051 | -0.1219 | 79.340 | 14.0887 |
| 25.0 | 10.8148 | 33.2281 | 25.429 | 254.51 | 0.064 | -0.1217 | 79.845 | 13.8984 |
| 30.0 | 10.7654 | 33.2353 | 25.444 | 253.25 | 0.077 | -0.1249 | 80.120 | 13.5920 |
| 40.0 | 10.5420 | 33.2537 | 25.497 | 248.38 | 0.102 | -0.1504 | 82.620 | 12.6565 |
| 50.0 | 10.1387 | 33.3657 | 25.654 | 233.68 | 0.126 | -0.1321 | 85.670 | 11.8216 |
| 60.0 | 9.8540 | 33.4132 | 25.739 | 225.79 | 0.149 | -0.1433 | 86.820 | 10.6388 |
| 70.0 | 9.7949 | 33.5032 | 25.819 | 218.37 | 0.171 | -0.0818 | 87.420 | 9.7960 |
| 80.0 | 9.7501 | 33.6136 | 25.913 | 209.67 | 0.193 | -0.0018 | 89.200 | 8.8796 |
| 100.0 | 9.5183 | 33.8025 | 26.099 | 192.39 | 0.233 | 0.1090 | 89.710 | 6.4777 |
| 150.0 | 8.6729 | 34.0057 | 26.393 | 165.25 | 0.321 | 0.1328 | 90.170 | 3.4557 |
| 200.0 | 7.9602 | 34.0443 | 26.532 | 152.77 | 0.401 | 0.0540 | 90.300 | 2.7583 |
| 250.0 | 7.4991 | 34.0809 | 26.628 | 144.30 | 0.475 | 0.0151 | 90.390 | 2.3584 |
| 300.0 | 7.1443 | 34.0880 | 26.684 | 139.61 | 0.546 | -0.0299 | 90.420 | 2.0433 |
| 350.0 | 6.4335 | 34.1190 | 26.805 | 128.47 | 0.613 | -0.1017 | 90.400 | 1.6298 |
| 400.0 | 6.2600 | 34.1769 | 26.874 | 122.56 | 0.676 | -0.0790 | 89.710 | 1.1301 |
| 450.0 | 5.8911 | 34.1978 | 26.937 | 116.89 | 0.735 | -0.1096 | 90.380 | 0.7693 |
| 500.0 | 5.7282 | 34.2407 | 26.992 | 112.24 | 0.792 | -0.0963 | 90.350 | 0.5313 |
| 550.0 | 5.5167 | 34.2824 | 27.051 | 107.07 | 0.847 | -0.0895 | 90.400 | 0.3583 |
| 600.0 | 5.2933 | 34.3029 | 27.094 | 103.32 | 0.900 | -0.1002 | 90.340 | 0.2362 |
| 650.0 | 4.9731 | 34.3426 | 27.163 | 96.96 | 0.950 | -0.1061 | 90.330 | 0.1605 |
| 700.0 | 4.8219 | 34.3676 | 27.200 | 93.78 | 0.998 | -0.1038 | 89.960 | 0.1232 |
| 750.0 | 4.6379 | 34.3887 | 27.238 | 90.48 | 1.044 | -0.1078 | 90.120 | 0.1133 |
| 800.0 | 4.4421 | 34.4098 | 27.276 | 87.04 | 1.088 | -0.1126 | 90.040 | 0.1205 |
| 1000.0 | 3.9753 | 34.4556 | 27.363 | 79.85 | 1.255 | -0.1265 | 90.080 | 0.1980 |
| 1010.0 | 3.9375 | 34.4583 | 27.369 | 79.29 | 1.263 | -0.1282 | 90.060 | 0.2271 |

**STATION:** 31 **DATE:** May 6, 1999 1739 UT
**LATITUDE:** 36° 02.38' N. **LONGITUDE:** 122° 44.49 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 10.8330 | 33.3644 | 25.532 | 244.24 | 0.005 | -0.0092 | 79.880 | 10.1668 |
| 5.0 | 10.8152 | 33.3664 | 25.536 | 243.86 | 0.012 | -0.0108 | 79.750 | 9.0877 |
| 10.0 | 10.7471 | 33.3908 | 25.567 | 241.02 | 0.024 | -0.0038 | 79.570 | 9.0503 |
| 15.0 | 10.5948 | 33.4770 | 25.661 | 232.20 | 0.036 | 0.0374 | 79.820 | 8.8603 |
| 20.0 | 10.5583 | 33.5445 | 25.720 | 226.70 | 0.048 | 0.0845 | 80.040 | 8.6512 |
| 25.0 | 10.5638 | 33.6044 | 25.766 | 222.46 | 0.059 | 0.1329 | 79.900 | 8.5222 |
| 30.0 | 10.5679 | 33.6194 | 25.777 | 221.52 | 0.070 | 0.1454 | 79.720 | 8.4485 |
| 40.0 | 10.4386 | 33.6068 | 25.790 | 220.52 | 0.092 | 0.1124 | 80.540 | 8.1870 |
| 50.0 | 10.3578 | 33.5924 | 25.793 | 220.46 | 0.114 | 0.0865 | 81.200 | 7.9080 |
| 60.0 | 10.0099 | 33.5788 | 25.842 | 216.01 | 0.136 | 0.0151 | 85.670 | 7.1821 |
| 70.0 | 9.7896 | 33.7112 | 25.982 | 202.87 | 0.157 | 0.0826 | 89.150 | 5.7386 |
| 80.0 | 9.5354 | 33.8255 | 26.114 | 190.57 | 0.176 | 0.1304 | 89.950 | 4.3143 |
| 100.0 | 9.2230 | 33.8894 | 26.215 | 181.34 | 0.214 | 0.1293 | 90.100 | 3.7134 |
| 150.0 | 8.4121 | 34.0134 | 26.439 | 160.80 | 0.299 | 0.0985 | 90.270 | 3.3418 |
| 200.0 | 7.6765 | 34.0551 | 26.582 | 147.92 | 0.376 | 0.0209 | 90.380 | 2.9433 |
| 250.0 | 7.1255 | 34.0568 | 26.662 | 140.93 | 0.448 | -0.0566 | 90.480 | 2.6403 |
| 300.0 | 6.5176 | 34.0678 | 26.753 | 132.70 | 0.517 | -0.1306 | 90.470 | 2.1588 |
| 350.0 | 6.2990 | 34.1317 | 26.832 | 125.77 | 0.581 | -0.1091 | 90.450 | 1.5475 |
| 400.0 | 6.2312 | 34.1777 | 26.878 | 122.13 | 0.643 | -0.0821 | 90.420 | 1.0671 |
| 450.0 | 5.9668 | 34.1834 | 26.916 | 118.93 | 0.703 | -0.1116 | 90.420 | 0.8385 |
| 500.0 | 5.6895 | 34.2348 | 26.992 | 112.19 | 0.761 | -0.1057 | 90.390 | 0.5603 |
| 550.0 | 5.4614 | 34.2707 | 27.048 | 107.24 | 0.816 | -0.1053 | 90.340 | 0.3715 |
| 600.0 | 5.2796 | 34.2972 | 27.091 | 103.57 | 0.869 | -0.1062 | 90.050 | 0.2846 |
| 650.0 | 5.0436 | 34.3211 | 27.138 | 99.42 | 0.919 | -0.1150 | 90.270 | 0.2100 |
| 700.0 | 4.7928 | 34.3354 | 27.178 | 95.82 | 0.968 | -0.1323 | 90.460 | 0.1566 |
| 750.0 | 4.7019 | 34.3703 | 27.216 | 92.63 | 1.015 | -0.1153 | 90.470 | 0.1412 |
| 800.0 | 4.4336 | 34.3841 | 27.257 | 88.85 | 1.061 | -0.1338 | 90.470 | 0.1307 |
| 1000.0 | 3.8316 | 34.4573 | 27.379 | 78.02 | 1.226 | -0.1394 | 90.430 | 0.3323 |
| 1010.0 | 3.8010 | 34.4611 | 27.385 | 77.46 | 1.234 | -0.1395 | 90.460 | 0.3473 |

**STATION:** 32 **DATE:** May 6, 1999 1949 UT
**LATITUDE:** 36° 10.27 N. **LONGITUDE:** 122° 32.57 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 11.6007 | 33.5250 | 25.518 | 245.53 | 0.005 | 0.2604 | 76.320 | 9.1576 |
| 5.0 | 11.5990 | 33.5255 | 25.519 | 245.54 | 0.012 | 0.2603 | 76.330 | 10.9004 |
| 10.0 | 11.5431 | 33.5366 | 25.538 | 243.85 | 0.025 | 0.2585 | 76.260 | 13.4799 |
| 15.0 | 10.5295 | 33.6314 | 25.793 | 219.69 | 0.036 | 0.1485 | 79.750 | 15.7361 |
| 20.0 | 10.2467 | 33.5962 | 25.814 | 217.76 | 0.047 | 0.0707 | 83.670 | 16.7011 |
| 25.0 | 10.1680 | 33.5979 | 25.829 | 216.45 | 0.058 | 0.0583 | 84.980 | 16.9249 |
| 30.0 | 10.0662 | 33.5895 | 25.840 | 215.53 | 0.069 | 0.0339 | 85.970 | 16.3778 |
| 40.0 | 9.8070 | 33.5871 | 25.882 | 211.76 | 0.090 | -0.0125 | 87.910 | 15.7183 |
| 50.0 | 9.6363 | 33.6352 | 25.948 | 205.69 | 0.111 | -0.0032 | 88.990 | 14.7068 |
| 60.0 | 9.6246 | 33.8152 | 26.091 | 192.35 | 0.131 | 0.1375 | 88.840 | 13.0969 |
| 70.0 | 9.4003 | 33.8700 | 26.170 | 184.97 | 0.150 | 0.1435 | 89.330 | 11.3958 |
| 80.0 | 9.1791 | 33.9152 | 26.241 | 178.38 | 0.168 | 0.1430 | 89.510 | 9.8899 |
| 100.0 | 8.7625 | 33.9716 | 26.352 | 168.23 | 0.203 | 0.1207 | 89.940 | 7.7018 |
| 150.0 | 8.2971 | 34.0333 | 26.472 | 157.63 | 0.284 | 0.0967 | 90.130 | 5.2754 |
| 200.0 | 7.9251 | 34.0932 | 26.576 | 148.63 | 0.360 | 0.0875 | 90.240 | 4.0098 |
| 250.0 | 7.4094 | 34.1088 | 26.663 | 140.98 | 0.433 | 0.0244 | 90.320 | 2.9824 |
| 300.0 | 6.8485 | 34.1335 | 26.761 | 132.21 | 0.501 | -0.0345 | 90.320 | 2.1717 |
| 350.0 | 6.5658 | 34.1561 | 26.817 | 127.46 | 0.566 | -0.0551 | 90.380 | 1.4747 |
| 400.0 | 6.0385 | 34.1760 | 26.901 | 119.77 | 0.628 | -0.1079 | 90.360 | 1.0462 |
| 450.0 | 5.9715 | 34.2245 | 26.948 | 115.94 | 0.687 | -0.0785 | 90.270 | 0.7296 |
| 500.0 | 5.6335 | 34.2386 | 27.002 | 111.20 | 0.743 | -0.1095 | 90.350 | 0.5207 |
| 550.0 | 5.4356 | 34.2755 | 27.055 | 106.56 | 0.798 | -0.1045 | 90.370 | 0.3615 |
| 600.0 | 5.1197 | 34.2971 | 27.110 | 101.60 | 0.850 | -0.1248 | 90.400 | 0.2362 |
| 650.0 | 4.9969 | 34.3345 | 27.154 | 97.85 | 0.900 | -0.1098 | 90.370 | 0.1572 |
| 700.0 | 4.8260 | 34.3698 | 27.202 | 93.67 | 0.947 | -0.1016 | 90.290 | 0.1138 |
| 750.0 | 4.6518 | 34.3891 | 27.237 | 90.62 | 0.993 | -0.1060 | 90.290 | 0.0967 |
| 800.0 | 4.4615 | 34.4099 | 27.274 | 87.27 | 1.038 | -0.1105 | 90.130 | 0.0966 |
| 1000.0 | 3.9449 | 34.4575 | 27.368 | 79.35 | 1.204 | -0.1280 | 90.160 | 0.1496 |
| 1010.0 | 3.9184 | 34.4606 | 27.373 | 78.89 | 1.212 | -0.1283 | 90.100 | 0.1557 |

**STATION:** 33 **DATE:** May 7, 1999 0357 UT
**LATITUDE:** 36° 18.04 N. **LONGITUDE:** 122° 23.70 W.

| Pres. (dbar) | Temp. (°C) | Sal. | $\gamma_\theta$ (kg/m$^3$) | $\delta$ | $\Sigma\Delta D$ | $\pi$ | Trans. (%) | Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 11.3817 | 33.4741 | 25.519 | 245.48 | 0.005 | 0.1789 | 81.640 | 9.0729 |
| 5.0 | 11.3731 | 33.4752 | 25.521 | 245.32 | 0.012 | 0.1780 | 81.620 | 9.0098 |
| 10.0 | 11.2742 | 33.4875 | 25.549 | 242.81 | 0.024 | 0.1693 | 81.230 | 8.9030 |
| 15.0 | 10.8347 | 33.5517 | 25.677 | 230.69 | 0.036 | 0.1399 | 83.535 | 8.5784 |
| 20.0 | 10.3812 | 33.6167 | 25.807 | 218.44 | 0.047 | 0.1105 | 87.930 | 7.3898 |
| 25.0 | 10.3833 | 33.6199 | 25.810 | 218.34 | 0.058 | 0.1133 | 87.420 | 7.1455 |
| 30.0 | 10.5461 | 33.7089 | 25.851 | 214.54 | 0.069 | 0.2126 | 80.040 | 7.6247 |
| 40.0 | 10.0117 | 33.6948 | 25.932 | 207.05 | 0.090 | 0.1080 | 89.150 | 6.0153 |
| 50.0 | 9.8835 | 33.7338 | 25.984 | 202.30 | 0.111 | 0.1168 | 89.660 | 4.9730 |
| 60.0 | 9.6714 | 33.7958 | 26.068 | 194.53 | 0.131 | 0.1300 | 89.250 | 5.0381 |
| 70.0 | 9.6014 | 33.8183 | 26.097 | 191.95 | 0.150 | 0.1359 | 89.800 | 4.7077 |
| 80.0 | 9.3948 | 33.8588 | 26.163 | 185.90 | 0.169 | 0.1336 | 89.720 | 4.4984 |
| 100.0 | 8.9976 | 33.9549 | 26.302 | 173.03 | 0.205 | 0.1448 | 89.930 | 3.7241 |
| 150.0 | 8.2959 | 33.9880 | 26.437 | 160.98 | 0.288 | 0.0606 | 90.190 | 3.8684 |
| 200.0 | 7.6295 | 34.0395 | 26.576 | 148.42 | 0.365 | 0.0018 | 90.340 | 3.4457 |
| 250.0 | 7.1020 | 34.0456 | 26.656 | 141.44 | 0.437 | -0.0687 | 90.400 | 3.1065 |
| 300.0 | 6.4893 | 34.0561 | 26.747 | 133.20 | 0.506 | -0.1436 | 90.390 | 2.5447 |
| 350.0 | 6.2174 | 34.0874 | 26.808 | 128.01 | 0.572 | -0.1547 | 90.400 | 1.8744 |
| 400.0 | 5.8767 | 34.1283 | 26.884 | 121.25 | 0.634 | -0.1658 | 90.380 | 1.3436 |
| 450.0 | 6.0121 | 34.2295 | 26.947 | 116.09 | 0.693 | -0.0695 | 90.300 | 0.7021 |
| 500.0 | 5.4932 | 34.2293 | 27.011 | 110.13 | 0.750 | -0.1336 | 90.400 | 0.5439 |
| 550.0 | 5.4284 | 34.2856 | 27.064 | 105.72 | 0.804 | -0.0974 | 90.350 | 0.3462 |
| 600.0 | 5.2347 | 34.3134 | 27.109 | 101.81 | 0.856 | -0.0987 | 90.340 | 0.2600 |
| 650.0 | 4.9839 | 34.3454 | 27.164 | 96.89 | 0.905 | -0.1026 | 90.340 | 0.2099 |
| 700.0 | 4.8404 | 34.3655 | 27.197 | 94.16 | 0.953 | -0.1034 | 90.310 | 0.2031 |
| 750.0 | 4.6396 | 34.3907 | 27.239 | 90.36 | 0.999 | -0.1060 | 90.310 | 0.2131 |
| 800.0 | 4.4977 | 34.4098 | 27.271 | 87.71 | 1.044 | -0.1067 | 90.270 | 0.2578 |
| 1000.0 | 3.8545 | 34.4651 | 27.383 | 77.71 | 1.207 | -0.1310 | 90.070 | 0.4907 |
| 1200.0 | 3.3747 | 34.5067 | 27.464 | 70.51 | 1.354 | -0.1458 | 89.700 | 0.7897 |
| 1398.0 | 2.9394 | 34.5412 | 27.533 | 64.16 | 1.488 | -0.1592 | 89.820 | 1.1182 |

## Appendix B. Nutrient Tables.

Nutrient data for standard Niskin bottle depths are listed chronologically by CTD station. Italics indicate that the reported values are in question. Note that nutrient sampling was not performed at every CTD station. Also note that water samples were not collected during this cruise for dissolved oxygen analysis. (See section 2c for further details on the properties listed in these tables.)

**STATION:** 1 **DATE:** May 3, 1999 0243 UT
**LATITUDE:** 32° 06.94 N. **LONGITUDE:** 126° 54.49 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 2.0 | 14.8390 | 33.299 | 0.25 | 2.26 | 0.15 | 0.01 |
| 9.2 | 14.8231 | 33.296 | 0.33 | 2.15 | 0.12 | 0.02 |
| 18.9 | 14.7459 | 33.296 | 0.48 | 2.13 | 0.04 | 0.01 |
| 40.0 | 14.7433 | 33.297 | 0.33 | 2.18 | 0.07 | 0.03 |
| 59.7 | 14.0885 | 33.223 | 0.32 | 2.33 | 0.05 | 0.00 |
| 80.2 | 13.8596 | 33.188 | 0.23 | 2.10 | 0.07 | 0.00 |
| 100.4 | 13.8256 | 33.187 | 0.29 | 2.06 | 0.06 | 0.07 |
| 199.8 | 11.3721 | 33.777 | 0.85 | 10.19 | 10.73 | 0.05 |
| 403.5 | 6.4829 | 34.005 | 2.34 | 52.93 | 33.00 | 0.02 |
| 604.6 | 5.0217 | 34.173 | 3.14 | 87.35 | 42.12 | 0.08 |
| 804.5 | 4.4314 | 34.349 | 3.06 | 108.20 | 43.98 | 0.01 |
| 1005.8 | 3.8717 | 34.449 | 3.20 | 106.60 | 42.91 | 0.05 |

**STATION:** 2 **DATE:** May 3, 1999 0812 UT
**LATITUDE:** 32° 12.98 N. **LONGITUDE:** 126° 47.86 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 2.5 | 14.8083 | 33.338 | 0.26 | 2.12 | 0.00 | 0.01 |
| 9.2 | 14.8130 | 33.360 | 0.24 | 1.70 | 0.00 | 0.03 |
| 19.6 | 14.8136 | 33.361 | 0.21 | 2.10 | 0.00 | 0.01 |
| 40.1 | 14.7377 | 33.345 | 0.46 | 1.86 | 0.00 | 0.01 |
| 59.4 | 14.5475 | 33.307 | 0.35 | 1.77 | 0.07 | 0.05 |
| 81.2 | 13.9770 | 33.207 | 0.32 | 1.96 | 0.04 | 0.04 |
| 100.3 | 13.9974 | 33.271 | 0.26 | 2.19 | 0.03 | 0.04 |
| 201.6 | 9.8782 | 33.729 | 1.19 | 18.57 | 19.24 | 0.00 |
| 401.9 | 6.4807 | 34.004 | 2.15 | 53.09 | 33.37 | 0.01 |
| 604.5 | 5.0427 | 34.197 | 3.05 | 87.68 | 42.49 | 0.02 |
| 805.8 | 4.3955 | 34.367 | 3.34 | 107.26 | 43.87 | 0.03 |
| 1006.8 | 3.8166 | 34.456 | *2.53* | *87.02* | *28.05* | *0.05* |

**STATION:** 3 **DATE:** May 3, 1999 1021 UT
**LATITUDE:** 32° 21.12 N. **LONGITUDE:** 126° 39.70 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 2.7 | 15.0132 | 33.474 | 0.48 | 4.95 | 0.10 | 0.02 |
| 10.6 | 15.0077 | 33.470 | 0.27 | 5.73 | 0.08 | 0.03 |
| 20.6 | 14.9977 | 33.468 | 0.20 | 6.75 | 0.06 | 0.03 |
| 40.4 | 15.0046 | 33.468 | 0.22 | 7.79 | 0.05 | 0.03 |
| 60.7 | 14.9430 | 33.474 | 0.20 | 8.96 | 0.06 | 0.02 |
| 82.0 | 15.0153 | 33.493 | 0.46 | 13.25 | 0.06 | 0.00 |
| 201.6 | 10.1491 | 33.882 | 1.14 | 16.56 | 17.01 | 0.02 |
| 401.9 | 6.5587 | 33.981 | 2.14 | 49.89 | 31.69 | 0.03 |
| 603.3 | 4.8550 | 34.157 | 2.92 | 91.38 | 42.63 | 0.03 |
| 806.1 | 4.4701 | 34.363 | 3.25 | 108.38 | 44.40 | 0.00 |
| 1007.6 | 3.8625 | 34.452 | 3.29 | 121.87 | 44.84 | 0.02 |

**STATION:** 5 **DATE:** May 3, 1999 1434 UT
**LATITUDE:** 32° 37.13 N. **LONGITUDE:** 126° 23.40 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1.4 | 14.4586 | 33.272 | 0.28 | 2.26 | 0.09 | 0.02 |
| 1010.5 | 3.7687 | 34.443 | *2.80* | *116.07* | *39.40* | *0.05* |
| 1260.8 | 3.1598 | 34.516 | 3.16 | 138.63 | 44.53 | 0.00 |
| 1260.8 | 3.1598 | 34.516 | 3.17 | 139.67 | 44.05 | 0.03 |
| 1764.7 | 2.3689 | 34.590 | 3.16 | 157.41 | 42.93 | 0.01 |
| 2273.0 | 1.8708 | 34.633 | 3.02 | 170.21 | 40.84 | 0.02 |
| 2273.0 | 1.8708 | 34.633 | 2.98 | 170.92 | 41.27 | 0.03 |
| 2527.0 | 1.7610 | 34.646 | 2.88 | 172.05 | 41.00 | 0.01 |
| 3039.0 | 1.5916 | 34.663 | 2.82 | 173.33 | 40.05 | 0.02 |
| 3555.1 | 1.4961 | 34.676 | 2.72 | 170.99 | 38.51 | 0.01 |
| 4059.6 | 1.4897 | 34.683 | 2.81 | 163.14 | 38.03 | 0.02 |
| 4311.7 | 1.5100 | 34.684 | 2.84 | 163.83 | 37.67 | 0.01 |

**STATION:** 6 **DATE:** May 3, 1999 1827 UT
**LATITUDE:** 32° 45.27 N. **LONGITUDE:** 126° 15.23 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1.9 | 14.5405 | 33.270 | 0.35 | 2.11 | 0.11 | 0.02 |
| 10.7 | 14.5020 | 33.271 | 0.32 | 1.86 | 0.12 | 0.02 |
| 20.8 | 14.4410 | 33.270 | 0.25 | 2.36 | 0.09 | 0.03 |
| 40.8 | 14.4085 | 33.268 | 0.30 | 2.82 | 0.10 | 0.01 |
| 60.6 | 14.3776 | 33.265 | 0.18 | 3.53 | 0.10 | 0.01 |
| 80.7 | 13.8052 | 33.283 | 0.20 | 3.27 | 0.09 | 0.01 |
| 101.1 | 14.2801 | 33.550 | 0.22 | 3.61 | 0.49 | 0.09 |
| 201.4 | 9.2213 | 33.878 | 1.45 | 24.16 | 22.60 | 0.03 |
| 403.9 | 6.4651 | 34.081 | 2.52 | 60.53 | 36.61 | 0.03 |
| 604.2 | 5.1946 | 34.233 | 3.44 | 88.45 | 40.87 | 0.01 |
| 806.5 | 4.2833 | 34.359 | 3.29 | 111.89 | 44.29 | 0.02 |
| 1008.3 | 3.7442 | 34.450 | 3.15 | 122.97 | 44.79 | 0.01 |

**STATION:** 7 **DATE:** May 3, 1999 2031 UT
**LATITUDE:** 32° 53.21 N. **LONGITUDE:** 126° 06.95 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1.4 | 14.2083 | 33.207 | 0.30 | 2.30 | 0.16 | 0.04 |
| 9.4 | 14.1644 | 33.212 | 0.29 | 1.99 | 0.18 | 0.02 |
| 19.5 | 14.0768 | 33.206 | 0.42 | 2.16 | 0.19 | 0.02 |
| 41.4 | 14.0123 | 33.206 | 0.20 | 1.89 | 0.17 | 0.03 |
| 60.5 | 13.9944 | 33.206 | 0.32 | 1.88 | 0.28 | 0.03 |
| 80.0 | 13.6606 | 33.246 | 0.18 | 1.79 | 0.25 | 0.05 |
| 100.3 | 13.7853 | 33.209 | 0.19 | 1.84 | 0.20 | 0.00 |
| 200.7 | 9.2337 | 33.840 | 1.57 | 24.04 | 23.04 | 0.02 |
| 401.0 | 6.3647 | 34.053 | 2.56 | 59.41 | 36.20 | 0.03 |
| 604.3 | 5.0687 | 34.234 | 3.07 | 91.81 | 42.77 | 0.03 |
| 803.7 | 4.2973 | 34.379 | 3.15 | 90.74 | 42.76 | 0.02 |
| 1008.8 | 3.7306 | 34.457 | 3.09 | 126.15 | 44.79 | 0.01 |

**STATION:** 9 **DATE:** May 4, 1999 0044 UT
**LATITUDE:** 33° 09.21 N. **LONGITUDE:** 125° 50.43 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 3.0 | 14.2756 | 33.238 | 0.44 | 1.52 | 0.05 | 0.03 |
| 1258.7 | 3.1483 | 34.518 | 2.91 | 136.67 | 44.32 | 0.01 |
| 1258.7 | 3.1483 | 34.518 | 3.22 | 139.10 | 44.30 | 0.01 |
| 1511.8 | 2.6782 | 34.558 | 3.07 | 151.04 | 43.81 | 0.01 |
| 1765.8 | 2.2700 | 34.590 | 2.49 | 160.09 | 42.72 | 0.02 |
| 2018.4 | 1.9972 | 34.619 | 2.85 | 166.54 | 41.76 | 0.01 |
| 2274.6 | 1.8297 | 34.637 | 2.58 | 173.60 | 41.69 | 0.02 |
| 2528.1 | 1.7100 | 34.648 | 2.88 | 171.75 | 41.07 | 0.00 |
| 3548.0 | 1.4863 | 34.677 | 2.79 | 169.43 | 38.77 | 0.00 |
| 3548.0 | 1.4863 | 34.677 | 2.66 | 171.47 | 38.60 | 0.01 |
| 4060.2 | 1.4927 | 34.682 | *2.22* | *127.12* | *26.38* | *0.04* |
| 4493.5 | 1.5304 | 34.684 | 2.43 | 165.08 | 38.07 | 0.02 |

**STATION:** 10 **DATE:** May 4, 1999 0646 UT
**LATITUDE:** 33° 17.30 N. **LONGITUDE:** 125° 42.29 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1.6 | 14.2145 | 33.236 | 0.48 | 2.17 | 0.05 | 0.03 |
| 10.4 | 14.2169 | 33.235 | 0.33 | 2.06 | 0.06 | 0.00 |
| 21.0 | 14.2325 | 33.242 | 0.30 | 1.93 | 0.12 | 0.01 |
| 39.3 | 14.2561 | 33.314 | 0.16 | 1.76 | 0.05 | 0.02 |
| 59.5 | 14.2184 | 33.309 | 0.14 | 1.67 | 0.03 | 0.03 |
| 80.2 | 14.2011 | 33.306 | 0.28 | 1.52 | 0.06 | 0.00 |
| 100.1 | 14.1293 | 33.302 | 0.34 | 1.43 | 0.17 | 0.18 |
| 201.3 | 8.9583 | 33.890 | 1.09 | 25.76 | 24.15 | 0.03 |
| 403.6 | 6.1052 | 34.033 | 2.42 | 59.82 | 36.34 | 0.01 |
| 601.8 | 4.8382 | 34.182 | 3.05 | 86.24 | 41.85 | 0.02 |
| 806.5 | 4.4170 | 34.370 | 3.32 | 110.44 | 44.42 | 0.00 |

**STATION:** 11 **DATE:** May 4, 1999 0908 UT
**LATITUDE:** 33° 25.10 N. **LONGITUDE:** 125° 33.84 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1.5 | 14.0912 | 33.222 | 0.27 | 2.43 | 0.10 | 0.01 |
| 9.9 | 14.0951 | 33.222 | 0.29 | 2.07 | 0.11 | 0.01 |
| 20.1 | 14.1048 | 33.222 | 0.14 | 2.12 | 0.05 | 0.00 |
| 40.5 | 14.0836 | 33.229 | 0.14 | 2.06 | 0.06 | 0.00 |
| 60.4 | 13.9352 | 33.224 | 0.23 | 1.91 | 0.04 | 0.01 |
| 80.5 | 13.9097 | 33.228 | 0.16 | 1.88 | 0.03 | 0.00 |
| 101.1 | 13.5161 | 33.214 | 0.24 | 2.33 | 0.56 | 0.01 |
| 202.1 | 8.9809 | 33.908 | 1.40 | 21.82 | 20.05 | 0.00 |
| 403.0 | 6.2278 | 34.021 | 2.22 | 59.02 | 35.50 | 0.01 |
| 604.3 | 5.1178 | 34.223 | 3.07 | 89.03 | 42.24 | 0.01 |
| 805.7 | 4.3625 | 34.388 | 3.16 | 108.76 | 44.36 | 0.00 |
| 1007.3 | 3.7713 | 34.457 | 3.21 | 123.54 | 44.73 | 0.01 |

**STATION:** 13 **DATE:** May 4, 1999 1316 UT
**LATITUDE:** 33° 41.09 N. **LONGITUDE:** 125° 17.00 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1006.6 | 3.7481 | 34.470 | 3.23 | 125.48 | 44.52 | 0.04 |
| 1261.3 | 3.1410 | 34.529 | 3.16 | 136.04 | 36.47 | 0.02 |
| 1515.1 | 2.7294 | 34.564 | 3.32 | 147.09 | 37.76 | 0.00 |
| 1766.0 | 2.3787 | 34.593 | 3.36 | 159.44 | 42.80 | 0.02 |
| 2019.5 | 2.1121 | 34.618 | 3.37 | 164.08 | 39.93 | 0.01 |
| 3036.4 | 1.5935 | 34.663 | 2.75 | 175.58 | 39.96 | 0.04 |
| 2528.0 | 1.7599 | 34.646 | *2.66* | *151.79* | *33.84* | *0.01* |
| 3036.4 | 1.5935 | 34.663 | 2.61 | 169.08 | 36.57 | 0.03 |
| 3545.5 | 1.4999 | 34.676 | 2.74 | 173.82 | 38.63 | 0.03 |
| 4059.6 | 1.4874 | 34.683 | 2.63 | 164.43 | 35.22 | 0.04 |
| 4059.6 | 1.4874 | 34.683 | 2.52 | 163.53 | 37.78 | 0.04 |
| 4059.6 | 1.4874 | 34.683 | 2.73 | 165.20 | 36.24 | 0.07 |

**STATION:** 14 **DATE:** May 4, 1999 1739 UT
**LATITUDE:** 33° 49.08 N. **LONGITUDE:** 125° 08.61 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1.8 | 11.7241 | 32.826 | 0.53 | 1.89 | 0.88 | 0.05 |
| 9.9 | 11.6736 | 32.834 | 0.38 | 1.88 | 0.89 | 0.04 |
| 20.0 | 11.5593 | 32.868 | 0.47 | 1.67 | 1.17 | 0.03 |
| 40.1 | 11.7286 | 32.968 | 0.53 | 2.03 | 1.54 | 0.04 |
| 59.7 | 11.9278 | 33.051 | 0.75 | 2.19 | 2.24 | 0.10 |
| 79.9 | 11.2903 | 33.047 | 0.86 | 4.57 | 4.81 | 0.09 |
| 101.0 | 10.8902 | 33.490 | 1.45 | 15.86 | 16.55 | 0.20 |
| 199.4 | 8.4089 | 33.992 | 1.58 | 31.94 | 25.49 | 0.01 |
| 402.0 | 6.3026 | 34.117 | 2.66 | 67.07 | 38.42 | 0.03 |
| 605.1 | 4.7192 | 34.222 | 2.98 | 88.64 | 36.49 | 0.03 |
| 805.6 | 4.3227 | 34.373 | 3.40 | 112.98 | 44.59 | 0.04 |
| 1010.2 | 3.6718 | 34.469 | 3.26 | 127.52 | 45.07 | 0.03 |

**STATION:** 15 **DATE:** May 4, 1999 1944 UT
**LATITUDE:** 33° 56.93 N. **LONGITUDE:** 125° 00.20 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1.8 | 12.4361 | 33.136 | 0.76 | 2.10 | 1.82 | 0.07 |
| 9.7 | 12.4081 | 33.140 | 0.56 | 1.92 | 1.80 | 0.07 |
| 19.9 | 12.3732 | 33.142 | 0.52 | 1.83 | 1.79 | 0.08 |
| 41.0 | 12.2569 | 33.186 | 0.45 | 1.35 | 1.73 | 0.05 |
| 59.9 | 12.1196 | 33.236 | 0.60 | 1.44 | 2.30 | 0.13 |
| 81.9 | 11.0538 | 33.213 | 0.87 | 7.73 | 7.72 | 0.19 |
| 104.4 | 10.2986 | 33.652 | 1.50 | 18.69 | 19.58 | 0.07 |
| 202.6 | 8.3307 | 34.003 | 1.99 | 30.31 | 24.93 | 0.03 |
| 401.8 | 5.9055 | 34.085 | 2.84 | 67.17 | 36.07 | 0.01 |
| 605.5 | 4.7235 | 34.204 | 3.26 | 95.30 | 42.20 | 0.03 |
| 806.2 | 4.1440 | 34.356 | 3.28 | 110.85 | 40.10 | 0.01 |
| 1008.5 | 3.7796 | 34.457 | 3.11 | 120.38 | 41.51 | 0.03 |

**STATION:** 17 **DATE:** May 4, 1999 2351 UT
**LATITUDE:** 34° 12.77 N. **LONGITUDE:** 124° 43.18 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1008.6 | 3.6805 | 34.465 | 3.22 | 124.15 | 44.40 | 0.02 |
| 1262.0 | 3.0878 | 34.522 | 3.35 | 136.31 | 40.73 | 0.00 |
| 1514.4 | 2.6464 | 34.563 | 3.32 | 152.07 | 43.86 | 0.01 |
| 1767.3 | 2.2746 | 34.592 | 3.03 | 148.81 | 38.61 | 0.02 |
| 2019.4 | 2.0077 | 34.617 | 3.20 | 168.79 | 42.26 | 0.01 |
| 2529.3 | 1.7234 | 34.649 | 2.87 | 170.55 | 40.53 | 0.03 |
| 2529.3 | 1.7234 | 34.649 | 2.64 | 170.58 | 40.21 | 0.01 |
| 3037.6 | 1.5846 | 34.664 | 2.87 | 174.30 | 39.87 | 0.02 |
| 3548.6 | 1.5019 | 34.675 | 2.52 | 146.92 | 31.07 | 0.02 |
| 4059.6 | 1.4905 | 34.683 | 2.83 | 165.16 | 37.89 | 0.02 |
| 4493.2 | 1.5264 | 34.684 | 2.64 | 163.15 | 38.01 | 0.03 |
| 4493.2 | 1.5264 | 34.684 | 2.67 | 163.04 | 37.86 | 0.02 |

**STATION:** 18 **DATE:** May 5, 1999 0414 UT
**LATITUDE:** 34° 20.47 N. **LONGITUDE:** 124° 34.79 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1.7 | 12.6516 | 33.183 | 0.66 | 1.59 | 1.58 | 0.10 |
| 9.4 | 12.6473 | 33.180 | 0.56 | 1.59 | 1.53 | 0.06 |
| 19.3 | 12.5806 | 33.279 | 0.52 | 1.30 | 2.24 | 0.13 |
| 39.4 | 12.2419 | 33.311 | 0.77 | 2.14 | 3.24 | 0.13 |
| 61.0 | 12.1237 | 33.316 | 0.77 | 3.09 | 4.16 | 0.16 |
| 78.6 | 10.6011 | 33.424 | 1.20 | 15.42 | 15.00 | 0.39 |
| 100.3 | 9.8294 | 33.629 | 1.67 | 22.70 | 22.14 | 0.03 |
| 204.2 | 8.0774 | 34.040 | 2.05 | 39.49 | 30.58 | 0.01 |
| 403.2 | 5.6906 | 34.089 | 2.90 | 73.95 | 39.87 | 0.02 |
| 603.0 | 4.6943 | 34.275 | 2.98 | 88.76 | 38.80 | 0.03 |
| 806.3 | 4.2130 | 34.406 | *2.74* | *94.77* | *32.49* | *0.01* |
| 1009.6 | 3.6652 | 34.469 | 2.91 | 123.33 | 38.73 | 0.09 |

**STATION:** 19 **DATE:** May 5, 1999 0643 UT
**LATITUDE:** 34° 28.45 N. **LONGITUDE:** 124° 26.10 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 3.2 | 12.3951 | 33.037 | 0.49 | 1.57 | 1.04 | 0.05 |
| 11.3 | 12.3928 | 33.035 | 0.53 | 1.56 | 0.99 | 0.03 |
| 19.9 | 12.3963 | 33.033 | 0.46 | 1.50 | 0.96 | 0.03 |
| 40.7 | 12.4582 | 33.190 | 0.52 | 1.21 | 1.77 | 0.12 |
| 60.2 | 11.9562 | 33.237 | 0.63 | 4.01 | 4.53 | 0.14 |
| 80.8 | 10.3786 | 33.559 | 1.54 | 16.94 | 18.57 | 0.06 |
| 102.4 | 9.7366 | 33.787 | 1.71 | 19.87 | 20.75 | 0.03 |
| 203.0 | 7.9925 | 34.061 | 2.31 | 40.85 | 31.82 | 0.03 |
| 402.5 | 5.5331 | 34.098 | 2.57 | 63.70 | 34.61 | 0.01 |
| 603.5 | 4.6935 | 34.280 | 2.92 | 77.79 | 34.98 | 0.03 |
| 805.3 | 4.1519 | 34.404 | 3.07 | 106.17 | 37.43 | 0.00 |
| 1007.6 | 3.6021 | 34.477 | 3.35 | 123.17 | 43.99 | 0.04 |

**STATION:** 21 **DATE:** May 5, 1999 1136 UT
**LATITUDE:** 34° 44.32 N. **LONGITUDE:** 124° 09.04 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1007.6 | 3.6942 | 34.464 | 3.00 | 120.69 | 35.88 | 0.06 |
| 1257.1 | 3.1397 | 34.524 | 3.25 | 133.60 | 44.01 | 0.05 |
| 1513.9 | 2.6934 | 34.561 | 3.08 | 136.81 | 38.65 | 0.02 |
| 1766.7 | 2.3197 | 34.589 | 3.17 | 153.92 | 41.25 | 0.05 |
| 2021.8 | 2.0631 | 34.615 | 2.92 | 141.70 | 34.93 | 0.03 |
| 2272.6 | 1.8749 | 34.632 | 2.87 | 155.01 | 41.13 | 0.25 |
| 2527.7 | 1.7804 | 34.646 | 2.79 | 161.39 | 36.27 | 0.05 |
| 3037.5 | 1.6123 | 34.664 | 2.73 | 155.77 | 34.98 | 0.02 |
| 3548.0 | 1.5214 | 34.675 | 2.75 | 165.80 | 37.77 | 0.04 |
| 4058.2 | 1.4905 | 34.683 | 2.56 | 155.58 | 33.03 | 0.02 |
| 4271.9 | 1.5050 | 34.684 | 2.64 | 156.57 | 37.97 | 0.02 |
| 4273.3 | 1.5052 | 34.684 | 2.64 | 158.10 | 38.26 | 0.03 |

**STATION:** 22 **DATE:** May 5, 1999 1607 UT
**LATITUDE:** 34° 51.94 N. **LONGITUDE:** 124° 00.25 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1.7 | 12.7200 | 33.295 | 0.57 | 3.16 | 2.17 | 0.12 |
| 11.0 | 12.7100 | 33.295 | 0.56 | 3.12 | 2.62 | 0.13 |
| 20.6 | 12.7071 | 33.296 | 0.55 | 3.12 | 2.66 | 0.19 |
| 60.2 | 12.7080 | 33.294 | 0.55 | 2.57 | 2.08 | 0.12 |
| 60.2 | 12.7080 | 33.294 | 0.54 | 2.41 | 2.06 | 0.11 |
| 80.6 | 11.6143 | 33.275 | 0.84 | 5.95 | 6.10 | 0.24 |
| 99.2 | 10.6717 | 33.520 | 1.42 | 14.95 | 16.61 | 0.15 |
| 200.7 | 8.1996 | 34.019 | 2.25 | 37.25 | 29.79 | 0.01 |
| 402.4 | 5.8125 | 34.039 | 2.85 | 65.21 | 38.50 | 0.01 |
| 602.7 | 5.0766 | 34.280 | 3.21 | 89.22 | 43.08 | 0.02 |
| 804.0 | 4.3473 | 34.394 | 3.34 | 104.60 | 44.76 | 0.01 |
| 1024.4 | 3.6719 | 34.470 | 3.36 | 118.08 | 44.66 | 0.02 |

**STATION:** 23 **DATE:** May 5, 1999 1849 UT
**LATITUDE:** 35° 00.14 N. **LONGITUDE:** 123° 51.72 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1.6 | 12.6611 | 33.300 | 0.59 | 2.66 | 2.38 | 0.10 |
| 11.0 | 12.6454 | 33.301 | 0.53 | 2.58 | 2.46 | 0.14 |
| 21.2 | 12.6400 | 33.300 | 0.52 | 2.46 | 2.37 | 0.10 |
| 60.0 | 12.5945 | 33.301 | 0.48 | 2.46 | 2.40 | 0.11 |
| 80.5 | 11.2551 | 33.305 | 1.07 | 9.59 | 10.49 | 0.33 |
| 102.5 | 10.2322 | 33.678 | 1.51 | 19.44 | 21.05 | 0.05 |
| 203.7 | 8.1219 | 34.012 | 2.10 | 34.57 | 28.75 | 0.00 |
| 401.4 | 5.9471 | 34.066 | 2.81 | 64.36 | 38.64 | 0.01 |
| 604.7 | 5.0821 | 34.271 | 2.99 | 86.78 | 41.11 | 0.56 |
| 805.8 | 4.3628 | 34.392 | 3.36 | 104.94 | 44.34 | 0.03 |
| 1009.0 | 3.7305 | 34.465 | 3.13 | 114.38 | 40.10 | 0.05 |

**STATION:** 25 **DATE:** May 5, 1999 2350 UT
**LATITUDE:** 35° 15.62 N. **LONGITUDE:** 123° 34.20 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1003.7 | 3.7976 | 34.460 | 3.08 | 120.73 | 44.63 | 0.02 |
| 1262.7 | 3.1696 | 34.523 | 3.03 | 132.18 | 42.11 | 0.00 |
| 1514.2 | 2.6985 | 34.565 | 3.34 | 142.80 | 43.77 | 0.01 |
| 1764.4 | 2.2897 | 34.592 | 2.93 | 152.23 | 43.17 | 0.01 |
| 2019.2 | 2.0623 | 34.618 | 3.14 | 154.60 | 42.24 | 0.01 |
| 2274.8 | 1.8887 | 34.634 | 2.93 | 158.18 | 41.40 | 0.07 |
| 2530.3 | 1.7635 | 34.646 | 2.79 | 158.43 | 36.32 | 0.05 |
| 2770.8 | 1.6916 | 34.657 | 2.88 | 157.34 | 40.35 | 0.02 |
| 3036.2 | 1.6229 | 34.664 | 2.66 | 157.27 | 40.09 | 0.02 |
| 3533.9 | 1.5507 | 34.673 | 2.85 | 154.81 | 36.64 | 0.01 |
| 4035.7 | 1.4958 | 34.683 | 2.59 | 156.32 | 36.85 | 0.02 |
| 4035.5 | 1.4959 | 34.683 | 2.67 | 155.42 | 33.75 | 0.01 |

**STATION:** 26 **DATE:** May 6, 1999 0356 UT
**LATITUDE:** 35° 23.32 N. **LONGITUDE:** 123° 25.66 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1.7 | 12.5598 | 33.367 | 0.59 | 2.88 | 2.79 | 0.10 |
| 10.6 | 12.5609 | 33.368 | 0.59 | 2.67 | 2.80 | 0.10 |
| 19.9 | 12.5633 | 33.368 | 0.57 | 2.70 | 2.85 | 0.16 |
| 39.6 | 12.5321 | 33.374 | 0.49 | 2.68 | 2.79 | 0.10 |
| 62.2 | 12.4101 | 33.363 | 0.60 | 2.84 | 3.01 | 0.09 |
| 81.9 | 10.5848 | 33.572 | *1.28* | *14.71* | *16.20* | *0.31* |
| 99.9 | 9.7023 | 33.746 | *1.79* | *22.57* | *22.89* | *0.35* |
| 199.8 | 7.9777 | 34.045 | 2.33 | 40.14 | 31.37 | 0.05 |
| 402.0 | 5.6536 | 34.058 | 2.46 | 56.27 | 32.70 | 0.27 |
| 603.1 | 4.7216 | 34.248 | *3.22* | *92.70* | *42.57* | *0.00* |
| 805.7 | 4.3314 | 34.394 | 3.06 | 111.64 | 37.94 | 0.01 |
| 1008.0 | 3.7434 | 34.466 | 3.19 | 137.22 | 42.80 | 0.15 |

**STATION:** 27 **DATE:** May 6, 1999 0617 UT
**LATITUDE:** 35° 31.17 N. **LONGITUDE:** 123° 16.80 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1.9 | 12.2321 | 33.307 | 0.77 | 1.80 | 2.57 | 0.28 |
| 11.3 | 12.2599 | 33.308 | 0.64 | 1.70 | 2.53 | 0.12 |
| 20.3 | 12.1905 | 33.295 | 0.56 | 1.45 | 2.43 | 0.14 |
| 40.7 | 12.2116 | 33.303 | 0.54 | 1.09 | 2.47 | 0.10 |
| 60.5 | 12.4321 | 33.360 | 0.57 | 2.19 | 2.79 | 0.13 |
| 80.3 | 10.5887 | 33.515 | 1.27 | 13.28 | 14.42 | 0.24 |
| 99.7 | 9.9784 | 33.623 | 1.70 | 21.28 | 21.77 | 0.06 |
| 202.9 | 8.2694 | 34.020 | 1.90 | 34.98 | 27.86 | 0.24 |
| 403.9 | 6.1293 | 34.143 | 2.96 | 69.02 | 39.25 | 0.00 |
| 603.7 | 4.9125 | 34.291 | 3.29 | 96.08 | 43.61 | 0.00 |
| 805.5 | 4.2311 | 34.387 | 3.44 | 113.04 | 44.87 | 0.01 |

**STATION:** 29 **DATE:** May 6, 1999 1100 UT
**LATITUDE:** 35° 46.93 N. **LONGITUDE:** 122° 59.36 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1008.9 | 3.7953 | 34.463 | 3.08 | 123.28 | 44.02 | 0.01 |
| 1259.7 | 3.1823 | 34.515 | 3.14 | 139.88 | 44.53 | 0.02 |
| 1512.8 | 2.7114 | 34.555 | 3.27 | 149.57 | 44.14 | 0.02 |
| 1765.9 | 2.3510 | 34.586 | -- | 159.49 | 42.76 | 0.10 |
| 2020.4 | 2.0966 | 34.612 | 2.79 | 164.53 | 39.10 | 0.23 |
| 2273.2 | 1.8901 | 34.637 | 2.91 | 165.29 | 35.43 | 0.02 |
| 2525.5 | 1.7746 | 34.646 | 2.94 | 168.80 | 40.63 | 0.01 |
| 2780.6 | 1.7257 | 34.656 | 2.99 | 169.13 | 39.91 | 0.02 |
| 3029.7 | 1.6625 | 34.662 | 2.76 | 169.19 | 38.39 | 0.07 |
| 3546.7 | 1.5778 | 34.672 | 2.82 | 169.91 | 38.99 | 0.00 |
| 3706.9 | 1.5551 | 34.675 | 2.92 | 170.80 | 38.92 | 0.01 |
| 3707.6 | 1.5551 | 34.675 | 2.76 | 171.79 | 38.52 | 0.11 |

**STATION:** 30 **DATE:** May 6, 1999 1518 UT
**LATITUDE:** 35° 54.48 N. **LONGITUDE:** 122° 50.43 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 1.0 | 10.9497 | 33.143 | 0.85 | 4.14 | 4.50 | 0.09 |
| 10.3 | 10.8920 | 33.188 | 0.94 | 4.45 | 5.33 | 0.10 |
| 19.3 | 10.8639 | 33.209 | 0.92 | 5.62 | 6.32 | 0.10 |
| 39.5 | 10.6308 | 33.188 | 1.09 | 9.27 | 9.21 | 0.13 |
| 59.7 | 9.8764 | 33.419 | 1.45 | 17.66 | 15.87 | 0.14 |
| 79.0 | 9.7537 | 33.669 | 1.89 | 25.58 | 24.53 | 0.21 |
| 101.8 | 9.4354 | 33.813 | 2.07 | 27.15 | 25.97 | 0.12 |
| 199.7 | 7.9227 | 34.070 | 2.29 | 43.48 | 32.23 | 0.05 |
| 401.8 | 6.1909 | 34.183 | 3.00 | 71.39 | 39.51 | 0.01 |
| 604.0 | 5.1867 | 34.312 | 3.42 | 93.83 | 42.83 | 0.02 |
| 804.8 | 4.4317 | 34.409 | 3.39 | 110.62 | 44.17 | 0.05 |
| 1009.1 | 3.9384 | 34.459 | 3.47 | 120.82 | 44.31 | 0.07 |

**STATION:** 31 **DATE:** May 6, 1999 1739 UT
**LATITUDE:** 36° 02.38 N. **LONGITUDE:** 122° 44.49 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 0.9 | 10.8632 | 33.339 | 1.01 | 5.98 | 7.86 | 0.14 |
| 9.9 | 10.7672 | 33.370 | 1.05 | 6.95 | 8.89 | 0.17 |
| 19.4 | 10.6361 | 33.438 | 1.14 | 9.72 | 11.23 | 0.26 |
| 38.6 | 10.5336 | 33.609 | 1.32 | 11.97 | 13.65 | 0.22 |
| 59.2 | 10.3265 | 33.581 | 1.40 | 14.59 | 15.20 | 0.25 |
| 80.8 | 9.5851 | 33.807 | 2.00 | 26.17 | 25.56 | 0.10 |
| 100.2 | 9.3018 | 33.871 | 2.13 | 29.27 | 27.20 | 0.13 |
| 198.6 | 7.7479 | 34.046 | 2.40 | 41.85 | 31.46 | 0.04 |
| 403.1 | 6.2067 | 34.176 | 2.94 | 68.23 | 39.20 | 0.01 |
| 603.5 | 5.2598 | 34.298 | 3.19 | 88.42 | 41.49 | 0.00 |
| 805.0 | 4.4995 | 34.395 | 3.20 | 105.83 | 44.04 | 0.02 |
| 1007.6 | 3.8081 | 34.460 | 3.44 | 119.70 | 44.79 | 0.03 |

**STATION:** 33 **DATE:** May 7, 1999 0357 UT
**LATITUDE:** 36° 18.04 N. **LONGITUDE:** 122° 23.70 W.

| Pressure | Temperature | Salinity | $PO_4$ | $Si(OH)_4$ | $NO_3$ | $NO_2$ |
|---|---|---|---|---|---|---|
| 41.7 | 10.5146 | 33.737 | 1.70 | 18.46 | 17.59 | 0.32 |
| 58.5 | 9.8667 | 33.724 | 1.90 | 25.89 | 24.46 | 0.27 |
| 79.2 | 9.2583 | 33.885 | 2.18 | 32.27 | 28.45 | 0.26 |
| 98.7 | 8.8876 | 33.959 | 2.15 | 33.58 | 28.79 | 0.13 |
| 201.6 | 7.4640 | 34.041 | 2.43 | 44.43 | 31.87 | 0.00 |
| 400.0 | 5.9774 | 34.196 | 3.06 | 73.73 | 39.30 | 0.01 |
| 604.8 | 5.1766 | 34.317 | 3.09 | 82.08 | 36.31 | 0.04 |
| 806.0 | 4.5690 | 34.401 | 3.12 | 94.26 | 39.01 | 0.07 |
| 1008.0 | 3.8872 | 34.461 | 3.17 | 121.39 | 44.86 | 0.12 |
| 1397.4 | 2.9597 | 34.539 | *2.77* | *114.86* | *32.07* | *0.06* |

## References

Firing, E., J. Ramada, P. Caldwell, Processing ADCP data with the CODAS software system (version 3.1), *JIMAR, Univ. of Hawaii*, 212pp, 1995.

Flament, P., A note on seawater spiciness and diffusive stability, *Personal Communication*, 1986.

Gruber, N., J. L. Sarmiento, Global patterns of marine nitrogen fixation and denitrification, *Global Biogeochem. Cycles*, *11*, 235-266, 1997.

Sakamoto, C.M., G.E. Friederich, L.A. Codispoti, MBARI procedures for automated nutrient analysis using a modified Alpkem Series 300 rapid flow analyzer, *MBARI Technical Report No. 90-2*, 1990.

UNESCO, International oceanographic tables, vol. 4, *National Institute of Oceanography of Great Britain and UNESCO (Paris)*, 1987.

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